RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.

PUBLISHED EVERY FRIDAY BY THE RAILROAD GAZETTE AT 83 FULTON STREET, NEW YORK
BRANCH OFFICES AT 375 OLD COLONY BUILDING, CHICAGO, AND QUEEN ANNE'S CHAMBERS, WESTMINSTER, LONDON

EDITORIAL ANNOUNCEMENTS.

THE BRITISH AND EASTERN CONTINENTS edition of the Railroad Gazette is published each Friday at Queen Anne's Chambers, Westminster, London. It contains selected reading pages from the Railroad Gazette, together with additional British and foreign matter, and is issued under the name Railway Gazette.

CONTRIBUTIONS.—Subscribers and others will materially assist in making our news accurate and complete if they will send early information of events which take place under their observation. Discussions of subjects pertaining to all departments of railroad business by men practically acquainted with them are especially desired.

ADVERTISEMENTS.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and these only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

OFFICERS.—In accordance with the law of the state of New York, the following announcement is made of the office of publication, at 83 Fulton St., New York, N.Y., and the names of the officers and editors of The Railroad Gazette:

OFFICERS:

W. H. BOARDMAN, *Prest. and Editor*
E. A. SIMMONS, *Vice-President*
RAY MORRIS, *Secretary*
R. S. CHISOLM, *Treas.*
I. B. RINES, *Cashier*
L. B. SHERMAN, *Western Manager*

EDITORS:

RAY MORRIS, *Man'g Editor*
BRAMAN B. ADAMS
CHARLES H. FRY
RODNEY HITT
GEORGE L. FOWLER
FRANK W. KRAEGER
HUGH RANKIN
BRADFORD BOARDMAN

CONTENTS

EDITORIAL:
- Permanent Convention Pier, Atlantic City 443
- Mr. Mather on the Railroad Problem.... 443
- Rail Sections and Specifications..... 443
- Increase in Weight of Freight Trains.... 444
- Wheel and Rail Sections 444
- Rock Island Company 445
- Chicago, Rock Island & Pacific 446
- St. Louis & San Francisco..... 448
- Chesapeake & Ohio 449
- Colorado & Southern 450
- New Publications 452

ILLUSTRATED:
- A Method of Uniform Signaling 456
- Railway Signal Association History..... 458
- Railway Signal Association. 459
- Electrification, Rochester Div., Erie R. R. 461

MISCELLANEOUS:
- The Railroad Problem 452
- Exhibits at the Railway Signal Association Convention 456
- Notes from the North-Western Bulletin.. 458
- Effects of Foreign Current on Automatic Block Signals. 466
- Railroad Commissioners' Convention..... 466
- Katanga Railroad (Note)..... 458

GENERAL NEWS SECTION:
- Notes 467
- Interstate Commerce Commission Rulings 468
- Obituary 469
- Meetings and Announcements 469
- Elections and Appointments 469
- Locomotive Building 471
- Car Building 471
- Railroad Structures 472
- Railroad Construction 472
- Railroad Corporation News 474
- Annual Reports:
  - Chicago, Rock Island & Pacific..... 475
  - St. Louis & San Francisco 477

VOL. XLIII., No. 16. FRIDAY, OCTOBER 18, 1907.

The Atlantic City Hotel Men's Association submitted to the street railroad associations holding their annual meetings this week at Atlantic City a proposition having in view the building of a permanent structure in which to hold their conventions, the building to be used also for the annual gatherings of the Master Car Builders' and American Railway Master Mechanics' Associations. If agreeable to the railroad men to meet at Atlantic City for a period of five consecutive years, beginning in 1909, the plan is to be laid before the organizations of supply men responsible for the exhibits at those conventions. The scheme is to rebuild part of one of the piers which projects into the ocean from the boardwalk so that it would accommodate all the exhibits of the June and October conventions, including heavy cars and locomotives, and provide a suitable hall for meeting purposes—all to be under one roof. Exhibitors will pay a fixed sum for each square foot of space, as is now the case. The bare idea of establishing a permanent meeting place for all of the large steam and street railroad associations is thoroughly good. We are not prepared to commend all the details of the plan as evolved by the Atlantic City Hotel Men's Association, but with certain modifications the scheme could be made acceptable. Those modifications should provide, among other things, for a permanent exhibition of railroad appliances, one that could be visited at any time during the year by those interested. It would not only be valuable to those bent on learning, but would mean a saving of a considerable sum of money now spent by exhibitors for transporting and installing and removing their exhibits. It is to be hoped that the present agitation of the subject will result in a workable plan. As far as the place, Atlantic City, is concerned, it is ideal in respect to location and hotel accommodations. Its present facilities for taking care of the large and constantly growing exhibitions of railroad appliances are limited.

Robert Mather, President of the Rock Island Company, has the distinction of presenting more clearly than it has ever been presented before the curious and anomalous railroad situation into which we have been brought this year. His discussion is so good and so sound that we reproduce it almost entire in another column. The principal points which Mr. Mather makes may be listed somewhat as follows:

(1) The prosperity of the nation depends directly upon the efficiency of its transportation system, so that any decrease in this efficiency affects prosperity instantly.

(2) The national government and the states bargained with private capital for the production of the railroads; if the present-day restrictions to the earning power of securities had originally been made, the railroads would not have been built.

(3) Business has expanded faster than the ability of the railroads to raise funds with which to cope with it has expanded; hence there has been much unsatisfactory service.

(4) Rate reductions are the only effective weapons in freight competition, and the railroads have been the victims, not the beneficiaries, of rebates. No rebate was ever given that was not also received.

(5) Regarding the influencing of legislative action, a condemnatory people should remember that there have been legislative highwaymen, and that these highwaymen were their representatives.

(6) Loaded dice must be excluded from corporation security manipulation.

(7) Railroad regulation must be practical regulation; not a crusade for abstract righteousness.

(8) The power that regulates must also protect.

It is a discouraging reflection that this address, which views complex problems with such conservative wisdom, will, like other conservative addresses, be read by those already in sympathy with its doctrines, and will not be read, in any tangible degree, by those who need to read it the most. But if the Chicago Association of Commerce and all the other commercial associations in the country can be made to see these things clearly; the need to check abuses, but the paramount need to check the highwayman and the demagogue in legislative and executive authority, it may be that the fearful and wonderful crusade against property and prosperity may be deprived of the popular support on which it now so flourishes.

RAIL SECTIONS AND SPECIFICATIONS.

The work of deciding on a new rail section is now in the best hands possible; namely, the American Railway Association and the manufacturers of steel rails. This close relation of the manufacturing interests and the consumers will bring out all that can be said on either side of the question and the ultimate result will no doubt be a section of rail metallurgically correct as regards relation of metal in head, web and flange, allowing the low finishing temperature necessary to produce tough reliable steel and a freedom from great shrinkage strains that always occur in rail sections not properly balanced. The trouble with the American Association of Civil Engineers rail sections was the tacit assumption that the

metal in the 100-lb. rail would be the same as that in the 65-lb. rails; the rails were designed and metal distributed to give the best results as a girder, but the use of the heavier rails soon showed that something was radically wrong with them and it was found to be due more to the section of rail than any other cause. This, we feel confident, will be overcome in the proposed new rail sections which will no doubt be given out shortly and come into general use.

The machinery of the American Society of Civil Engineers has proven to be too slow and cumbersome to handle this problem. All the other societies* stood aside and waited on the American Society of Civil Engineers to give the country a better heavy rail section. Their committee has worked some five years on the matter and has up to this time only concluded that more metal was required in the web and flanges of the heavier rails but has not offered rail sections for consideration by the society. This course forced the matter on the Railway Association and the manufacturers, as a change of the heavier sections was found to be absolutely necessary.

The same can be said as regards the rail specifications. The work of the other societies has been thorough and has no doubt formed a basis of the proposed specifications now under consideration by the Railway Association and the manufacturers. The resulting specifications, we feel confident, will be satisfactory to the other societies which have had this work under consideration, although it is not to be expected that every point in the specifications will be settled at once. Some of the most important matters will have to be left open and tried out with rails rolled to the new sections. The matter of specifications and section of rails are so intimately related that the only satisfactory way is to give a section a thorough trial before stating absolutely what can be expected from it. This has more bearing on the reductions in rolling and final finishing temperature with the new sections. It no doubt will be easier for the mills to modify their methods of rolling with the new than with the old sections. It is to be hoped that the other societies will endorse the proposed specifications as far as possible, and if there are any points that they cannot agree upon, that a thorough series of tests will be made to cover these differences of opinion and that they be settled on their merits.

Many of the conflicting opinions on rails and rail sections today are due in part to the unsatisfactory manner in which rail failures have been reported by the railroad companies, and it is to be hoped that a uniform blank for reporting rail failures will come into general use. Also that the information given by the mill inspectors will be in better shape than heretofore, as it is only by securing better methods of manufacture and a check on same that the best results can be obtained from Bessemer or open hearth steel rails.

INCREASE IN WEIGHT OF FREIGHT TRAINS.

In our issue of July 12 we discussed the tendencies of increase in freight train weights during the last ten years, and showed that this increase had averaged some 60 per cent. We are now able to supplement the figures previously given, with those from another characteristic group of roads, although the increase for this group is somewhat less than the previous average and amounts to about 50 per cent. Insufficiency of the records for the early part of the period makes a more exact presentation of data impossible.

In the case of the Chesapeake & Ohio, for example, where the records have been carefully kept, the increase of weight of eastbound trains on the James river division was from 2,350 tons in 1896 to 3,450 tons in 1906, coupled with a corresponding increase of engine weight of from 118,600 lbs. to 184,400 lbs. This increase occurred during the last half of the period, as no changes had been made up to 1901. During this period the car capacity had also risen so that the length of train did not grow with its weight, having risen from 40 cars in 1896 to 50 in 1906. Summarized, this means a rise of 47 per cent. in train tonnage; of 55 per cent. in the weight of engines, and of but 25 per cent. in the number of cars in a train, while the average speed both while running and including stops remained constant at 16 and 10 miles an hour respectively. This eastbound traffic over the James river division is on favorable grades for nearly the whole length of the run and is in the direction of traffic. Westbound, the empty tonnage rose from 705 to 1,103 during the same period with a length of train of 45 and 56 cars respectively.

On the Richmond division the same maximum tonnage of 3,450 was reached from the 2,280 prevailing in 1896, giving a somewhat greater increase, or a full 51 per cent., while the average speed, including stops, rose from 11 to 12 miles per hour.

The records of another road, the Cleveland, Cincinnati, Chicago & St. Louis, from 1898 to 1906, show a somewhat lower increase, but one that was spread over the eight years instead of being concentrated in the last five. In 1898 the standard freight engine was a ten-wheeler (4-6-0) weighing 136,550 lbs., of which 111,400 lbs. was upon the drivers. In 1901, a consolidation had been adopted, weighing 185,800 lbs., with 170,000 lbs. on the drivers; weights that were increased to 211,500 lbs. and 187,500 lbs. respectively in 1906. The trains hauled by these engines weighed 819,892 and 1,132 tons respectively and consisted of 33, 32 and 39 cars, by which the increase of car capacity or loading is well set forth. Here there was an increase of 38 per cent. in train tonnage while that of the engine weights was but 14 per cent.

In the case of the Chesapeake & Ohio the same average speed was maintained throughout the whole period despite the fact that there was an incrase of nearly 50 per cent. in the number of trains, but this average speed was low, and the average of delays in the two terminal years of the decade varied only three minutes. On the other hand, on the C., C., C. & St. L. there was a higher average speed throughout, but it dropped from 14.7 miles per hour in 1898 to 12.2 miles in 1901 and rose again to 13.3 in 1906. This was connected with a regular rise in the amount of traffic from 33 trains per day in 1898 to 36 in 1901 and 43 in 1906, coupled with an increase of passenger traffic from 13 to 15 to 23 trains per day, by which the freight work was delayed.

On the Central of New Jersey there has been an increase of about 5 per cent. in the weight of trains since 1901. If these figures are to be regarded as typical of what has taken place throughout the country, it will appear that the increase of about 50 per cent. in tonnage has been accomplished with an increase of about 25 per cent. in the number of cars per train, due probably to better loading and higher capacities. In each of the cases cited, furthermore, the average weights of trains that were given were somewhat below the maximum that had been hauled by the engine, so that the rating was apparently well within the capacity. Nor are these the highest records that have been made in daily work, but may be taken as good average practice of traffic handling in comparatively level sections of the country, and the maximum tonnage that can be hauled by the modern engine is such that in addition to the tonnage rating as to weight a limitation is also put upon the number of cars that are to be used. It is all well enough to raise engine weights and cylinder capacities to a point where the tractive effort is run up to great heights, but the question arises, how about the cars? The front drawbar of the first car must be capable of sustaining the full pull of the engine, and this link in the chain of the train is frequently too weak to sustain any such stress. There are some engines now at work that are confessedly too powerful for the draft rigging of the cars that they are to haul, and this being the case there arises the natural question of what's the use of going any further.

WHEEL AND RAIL SECTIONS.

It is repeating an old story to say that dissatisfaction has been expressed with more or less vehemence during the past year with the present conditions of rails and rail-making for American railroads. The dissatisfaction has extended not only to the quality of the rail but to the shape of its section as well as that of the wheel that is to roll upon it. The result has been that the Master Car Builders' Association has adopted, as recommended practice, a contour of tread and flange that differs slightly, but in what is considered an important respect, from the old long-established standard, and the Maintenance of Way Association has appointed a committee to look into the matter of rail sections and ascertain whether or not it will be possible to improve on the sections of the American Society of Civil Engineers, which are now so extensively used throughout the country.

It is evident that in the redesigning of the wheel and rail contours three objects should be kept in view: the reduction of the wear of the rail; the reduction of the wear of the wheel, and the reduction of the rolling resistance of the wheel on the rail. Between 15 and 20 years ago a great deal of interest was manifested in the subject of the relation of the wheel to the rail; the matter was discussed before the few railroad clubs then in existence, and M. N. Forney read an elaborate paper on the subject before the Master

*See their specifications in parallel columns, *Railroad Gazette*, Sept. 6, page 250.

Car Builders' Association in 1884. This paper gave a careful analysis of the relations of the wheel and rail; it summarized the opinions of railroad men on the subject, as they existed at the time, and contained a number of recommendations that were only partially followed in the standards that were afterwards adopted. No experiments were made and matters were in such an unsettled state at that date as to gage of both wheels and track that it was impossible to do more than express an opinion which could not be verified by facts.

Since that time the weight of cars and rails has been increased and the 100-lb. rail that was looked upon as a dream of Sandberg, who suggested it, has become a reality and common practice. Meanwhile opinions based upon everyday observations have led some to believe in the wide head for the rail while others think a narrower top would do better service. The head of the A. S. C. E. section has a top curvature of 12 in. radius with corners of $^{5}/_{16}$ in. radius and vertical sides. The two weights of 100 lbs. and 85 lbs. which are perhaps typical of current practice have widths of heads of $2^{3}/_{4}$ in. and $2^{9}/_{16}$ in. respectively. Briefly the advocates of a narrower head argue that by so rolling it, the metal will be worked to a finer texture, and cite the fact that when a rail is examined under the microscope there is a very marked difference between the structure at the sides and at the center. On the other hand, the wider head is claimed to offer a greater surface of metal for the support of the wheel and for wear, while neither side seem to pay much attention to what is actually taking place as the wheel rolls over the rail.

This matter has never been thoroughly probed, but certain investigations, the results of which will soon be made public, have led to the conclusion that the determination of the proper contours of the wheel and the rail are of great importance and will have a most decided influence upon the three factors that have been set forth as the aim of the modifications that have been and are likely to be made.

Inquiry among the chief engineers of a large number of railroads has brought out the fact that this relationship of the wheel to the rail is almost universally considered "a matter of very great importance," and one that the "joint committee on wheel and rail section should take up." But no information as to facts was obtained. In one case the writer had "concluded after careful observation on a road where there are many curves, that the vertical side of the rails results, in the case of curves, in a delay of the period when the friction of the wheel against the rail shall not only be that due to the tread but also that due to the flange. In other words, the time when flange friction or resistance takes effect is when the side of the rail at the upper corner has been so worn by the wheel flange that it has approximately reached the shape of the flange itself; that is, when it has a sloping side instead of a vertical side, with a top of considerable radius. Under this condition the rail receives a sort of grinding wear, produced by the wheel flange, and the wearing away of the rail on the outside of curves after the shaping to the flange has been well started is quite rapid. This fact alone has been considered an argument for the vertical sides to rails, especially on roads where there is much curvature. In this there has been no discussion of the radius of the curve at the top of the rail. Possibly that adopted may be a little short, but it is probable that the differences, when compared, are very small. Certainly the radius should not be less than it now is."

On the other hand a few electric roads report that the impression has been formed that the sharp corner and vertical side tend to cut away new wheels quite rapidly and thus form sharp flanges, although one engineer of a large road does not consider that it is a "very important subject," this influence of the contours on rolling resistances.

It is, of course, impossible to so design the wheel and rail that wear and frictional resistance can be done away with for no matter what shapes are used at the outset, wear will alter them to suit surrounding conditions as was brought out in a discussion at the American Society of Civil Engineers. Though this may be true, the question arises whether it will not be worth while to make an investigation in order to ascertain whether shape cannot mitigate wear and thus lessen train resistance.

In the course of the wheel and rail investigations referred to, it was borne in on the observer that the contour of the wheel had much to do with the rolling resistance, though definite figures as to the exact value of the variations used were not obtained. It appeared furthermore that the so-called rolling resistance of the wheel on the rail was, for low speeds at least, the most important factor in train resistance. And it was shown that the area of contact between the wheel and the rail was such that, even with the maximum wheel loads of 100,000-lb. capacity cars, it covered but a small fraction of the width of the head of the rail. This held true when the wheels were worn as well as when they were new. As for the area of this section in contact it was so small on both new and old wheels that the average pressure put upon it, when the wheel load was 20,000 lbs., was such that it far exceeded the limit of elasticity or even the breaking strength of the metal of the rail. The reason, then, why the whole top of the rail appears bright is because of the travel of the point of contact from one side of the head to the other.

The rapid rise in wheel loads on all roads during the past few years has made many subjects of investigation important that in the times of light rolling stock in the past would not have attracted attention. As yet there is no precise data available as to the effect of form of tread and flange on train resistance or even of the difference of new and worn rails on that item of railroad operation, but there seems to be a strong indication that it does have an influence, and, if such is the case, it is certainly deserving of more than a passing notice.

Rock Island Company.

The Rock Island Company is a holding corporation in which is vested the ultimate control of the various railroads included in the Rock Island and the St. Louis & San Francisco systems. The arrangement is unusually complex, because there is an intermediate company between the railroads and the final holding company. This is the Chicago, Rock Island & Pacific *Railroad*, which owns directly $70,067,700 of the $75,000,000 stock of the Chicago, Rock Island & Pacific Railway and all of the $29,000,000 common stock of the St. Louis & San Francisco Railroad. The reason that this intermediate holding company was created was that bonds were to be issued in acquiring the stocks of the railroads which were taken over and bonds issued by a mere holding company would not measure up to the standard either of savings bank or investment requirements that bonds equally well protected issued by a railroad company would reach. Therefore, the Chicago, Rock Island & Pacific Railroad Company issues the bonds which financed the consolidation, while the stock which was given with the bonds in exchange for the stocks of the operating railroads is issued by the Rock Island Company. Control of the whole consolidation, involving 14,270 miles of operated line, is centered and brought to a head in the $54,000,000 preferred stock of the Rock Island Company which, alone of the total $150,000,000 stock of that corporation, has voting power. Thus, actual control of the whole great combination of systems can be held through ownership of $28,000,000 of the preferred stock of the Rock Island Company.

On the face of the returns shown in the Rock Island Company's report, the fiscal year lately closed was not a prosperous one, for the combined income account of the Rock Island Company and of the Chicago, Rock Island & Pacific Railroad shows a surplus of only $155,289 remaining available for dividends on the Rock Island Company's stock. But, as a result of the very complexity of the interrelation between the different companies, this proves nothing at all as to the profitableness of the year's operations. Simply by adjusting the amount of dividends declared on the stock of the Chicago, Rock Island & Pacific Railway so that they will cover the interest payments on the Chicago, Rock Island & Pacific Railroad Company's bonds, the surplus available for the Rock Island Company's stock can be reduced to a nominal sum, the rest of the surplus earnings remaining in the operating railroad company's treasury or being used for its benefit. This is the policy which has been pursued during the last two years, or since the 4 per cent. dividends on Rock Island Company preferred stock were stopped in November, 1905, and the policy of general improvement of the railroad lines begun.

The real ownership of the Rock Island Company's stock, however, is in the surplus earnings of its subsidiary lines. In the case of the Chicago, Rock Island & Pacific Railway, for instance, the Rock Island Company really owns 70/75 of its surplus available for dividends. Last year this amounted to $8,750,000. Similarly the Rock Island Company owns all the St. Louis & San Francisco's surplus after dividends which amounted last year to a little less than $4,000,000 Carrying the process on a step further, the Rock Island Company really owns the surplus after dividends of the Chicago & Eastern Illinois, all of whose stock is owned by the St. Louis & San Francisco. Still further, the Rock Island Company really owns most of the surplus of the Evansville & Terre Haute, nearly all of whose common stock is owned by the Chicago & Eastern Illinois. Fortunately, it is no longer necessary to carry this process still a step further, as the operating results of the Evansville & Indianapolis which has been controlled by the Evansville & Terre Haute, are now merged with the returns of that property.

This is, of course, a somewhat theoretical viewpoint, as in the case of each of the operating railroad companies, part of the sur-

plus for the year would be used by the company which earned it for itself, either for in additions and improvements or for miscellaneous deductions or amounts written off which would properly be charged against the income of the year. Yet the results obtained in this way are of value in estimating the actual earnings' resources behind the stock of the Rock Island Company. Assuming that last year in each case the operating company used half of its surplus for its own purposes, the other half accruing to the Rock Island Company, this remainder would have amounted to 5.6 per cent. on the $49,000,000 outstanding preferred stock of the Rock Island Company. The total of the surpluses of the operating companies, without deductions, amounted to 18.8 per cent. on Rock Island Company preferred stock. It is therefore evident that the dividend on Rock Island preferred stock was earned and might have been paid. That it was not is one of the strongest arguments for the ultimate success of this great experiment in railroad consolidation. As long as the railroads themselves, which are the only earning companies in the complicated scheme, are below standard in roadbed and equipment, the corporate pyramid is not firmly set on its foundations. Once improved to the point of efficiency the system as a whole can stand firm and strong. The work which is being done toward bringing about this result is described in detail in the reviews of the reports of the Chicago, Rock Island & Pacific Railway, and of the St. Louis & San Francisco on the following pages.

The combined income account of the 14,100 average miles operated by the Chicago, Rock Island & Pacific; the St. Louis & San Francisco; the Chicago & Eastern Illinois, and the Evansville & Terre Haute, including subsidiary lines, gives a view in the large of the Rock Island Company's system. Gross earnings were $112,500,000, against $95,400,000 in 1906, an increase of about 18 per cent. Operating expenses rose from $63,300,000 to $74,200,000, leaving net earnings of $38,200,000, against $32,000,000 in 1906. The net income available for dividends was $15,000,000, against $10,700,000 in the previous year, of which $5,600,000 was paid out in dividends and the balance, $9,500,000, carried to profit and loss. The total deductions from profit and loss for the year were $6,600,000, leaving a net increase in surplus just under $4,000,000. The year was a most prosperous one, in which much more than the year before was spent on maintenance of the property, less disbursed in dividends and over twice as much kept as final profit.

In order to complete the view of the Rock Island Company's system, as a whole, the following statement of the combined operated mileage, separated in groups according to the company's custom, is included:

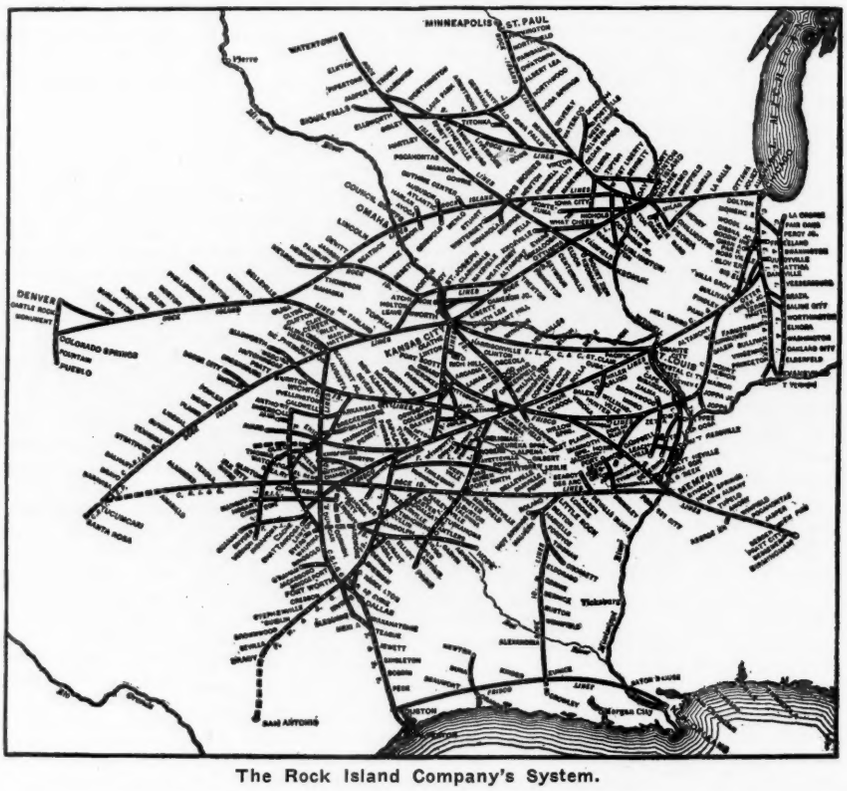
	Miles 1st main track,	Miles 2d & 3d track.	Miles yard trk. and sidings.	Trackage rights included in miles 1st main track.
Rock Island Lines:				
The Chic., Rock Isl. & Pac. Ry...	7,356	289	1,644	622
Chicago, Rock Isl. & El Paso Ry...	112	...	17	...
The Chic., Rock Isl. & Gulf Ry...	471	...	61	84
Total Rock Island lines.....	7,938	289	1,722	705
St. Louis & San Francisco R. R. Lines:				
St. Louis & San Francisco R. R..	2,862	17	618	4
St. L., Memp. & Southeastern R. R.	665	...	117	...
The K. C., Ft. Scott & Memph. Ry.	914	24	376	...
K. C., Memph. & Birmingham R. R.	286	...	99	...
Ft. Worth & Rio Grande Ry.....	196	...	28	...
St. Louis, San Francisco & Tex. Ry.	125	...	33	39
Paris & Great Northern R. R.....	17	...	7	...
Birmingham Belt R. R.....	...	...	25	...
Total, St. L. & S. F. R.R. lines	5,064	40	1,303	44
Chicago & Eastern Illinois R. R.....	957	171	469	130
Evansville & Terre Haute R. R. (including Evansv. & Indianap. R. R.)	310	...	138	10
Grand total	14,270	501	3,632	896

This mileage is located in the following states and territories:

Indiana	564	Forward	8,918
Illinois	1,049	Oklahoma Territory	1,562
Iowa	2,102	Indian Territory	1,289
Missouri	2,369	Tennessee	20
South Dakota	83	Arkansas	1,199
Minnesota	282	Alabama	128
Kansas	1,842	Mississippi	143
Nebraska	250	Louisiana	92
Colorado	376	Texas	808
		New Mexico Territory.....	112
Forward	8,918	Total	14,270

Chicago, Rock Island & Pacific Railway.

The Chicago, Rock Island & Pacific has had a year of splendid progress both in earnings and in the general improvement of the property which was begun simultaneously with the suspension of dividend payments late in 1905 on the 4 per cent. preferred stock of the Rock Island Company. In the previous fiscal year ended June 30, 1906, a great deal was done toward raising the physical standards of the track and permanent way. In that year the cost of rail renewals increased 230 per cent. On June 30, 1905, there were less than two miles of rails heavier than 80 lbs. to the yard on the whole of the 6,735 miles owned. In the 1906 year 487 miles of 85-lb. rails were laid. Last year, while the increase in the expense of rail renewals was only 4 per cent., this is to be compared with the tremendously increased figure of the preceding year. There were 140 miles of 85-lb. steel put down during the year, besides 170 miles of 80-lb. rails. On the 7,233 miles of line owned on June 30,



The Rock Island Company's System.

1907, 43 per cent. of the main, second and third track now has 80-lb. or heavier rails. Two years ago 65 per cent. of the main and second track had rails lighter than 80 lbs.

Th's is one particular instance of roadway improvement. There are other interesting features in the maintenance of way and structures account for the past year. This division of operating expenses as a whole increased 29 per cent. over the previous year, whose expenditures on this account were an increase of 25½ per cent. over the year before. The largest increases, instead of being in the rail and the tie items, were in repairs of roadway, 29 per cent.; repairs and renewals of bridges and culverts, 30 per cent.; repairs and renewals of fences, road crossings, signs and cattle guards, 37½ per cent., and repairs and renewals of telegraph, 56 per cent. The expense of maintenance of way per mile of road was $1,164, against $1,021, in 1906. In 1905 the figure was $823 a mile. The 1907 figures include the 299 miles of the St. Louis, Kansas City & Colorado from St. Louis to Kansas City now included in the general results of the system. There were 1,695,000 ties renewed, of which 915,000 were treated. The seriousness, present and potential, of the tie problem may be judged from the statement that great difficulty was experienced in securing an adequate supply of ties for renewals; this by a railroad whose lines can draw upon both the Northwest and the Southwest for its supply of timber.

There were 233 miles of new ballast put in place and 102 miles of line reballasted. Of the 7,522 miles of track, 1,223 were on June 30 ballasted with rock, 446 with burnt clay, 2,050 with gravel and 524 with cinders, leaving 3,279 miles of sand or dirt, or, in other words, unballasted track. Heavy expenditures were made in replacing light bridges with heavier ones and in strengthening existing bridges to provide for the heavier equipment now in use. In such cases an amount equal to the cost of the original structures

or the estimated cost of renewing them in kind was charged to operating expenses. Over a mile (6,100 lin. ft.) of timber bridges were replaced with steel, against 2,417 ft. in 1906, and nearly 3 miles (14,471 ft.) of bridges and trestles were filled, against 1,208 ft. in 1906. These facts clearly illustrate both the physical weakness of the property when the present campaign of improvement was begun and the effectiveness with which the campaign is being carried out.

The improvement policy was not confined to the roadway department. During the year there were acquired 6 balanced compound Atlantic locomotives, 72 consolidation locomotives, 11 Pacific locomotives and 20 switch engines. The increased use of the Atlantic and Pacific types suggests that the passenger business of the road is growing in quantity and excellence of service, while the addition of over 30 per cent. more new consolidation locomotives than were owned a year previous shows the growth in heavy freight traffic. There were 95 new passenger train cars put in service, including 10 dining cars, 5 observation library cars and 1 passenger motor car. Thirty new passenger train cars and another motor car are to be delivered before the end of 1907. The number of new freight cars was 6,737, a net increase of 3,399, or 13½ per cent. in number, but over 31 per cent. in capacity over the cars previously in service. Nearly 3,000 more freight cars are on order. There also were acquired 1 inspection motor car, 1 derrick, 1 rail saw, 10 caboose cars and 100 Hart convertible ballast cars. Fifty more cabooses are to be delivered shortly. Most of the new equipment was acquired through the Rock Island Improvement Company, which issues the equipment trusts of the road. This list of new equipment does not include 14 consolidation locomotives, 6 passenger train cars, 10 caboose cars, 274 stock cars and 1,000 box cars bought at a cost of $1,500,000 for the Rock Island, Arkansas & Louisiana, which owns the line shown on the map directly south of Little Rock, Ark. As illustrating the method of equipment accounting may be noted the case of one special type consolidation locomotive purchased at a cost of $19,871 to replace an engine lost in the Cimarron river, of whose cost $7,623 was charged to property account to offset the deduction from that account for the value of the lost engine, and the rest charged to operating expenses.

The maintenance cost per unit of equipment was $2,440 per locomotive, against $2,614 in 1906; $861 per passenger car, against $773 in 1906; $60 per freight car, against $55 in 1906, and $71 per work car, against $74 in 1906. The report states that on account of the large number of new locomotives put in service, the lower cost of maintenance per locomotive denotes no reduction in the maintenance standard.

It is evident that the Rock Island has now reached the point where its maintenance expenditures are not only fully taking care of the current depreciation of the property, but making up for insufficient maintenance expenditures in the past. There is still a great deal of work to be done. Every added year of prosperity during which the present liberal maintenance standard can be maintained will mean much in the future history of the company. With its lines once brought up to first-class standard, the Rock Island will be in a very strong position as regards surplus earnings on its railroad property.

Gross earnings last year increased $9,000,000, or 18 per cent., and operating expenses were $6,000,000, or 17 per cent. larger, leaving net earnings of $19,200,000, an increase of $3,000,000, or 19 per cent. The net income after charges was 11.6 per cent. on the $75,000,000 capital stock, on which, however, only 5½ per cent. was paid. There was no special improvement appropriation as in the previous year, but the whole of the surplus after dividends was carried to profit and loss, from which was deducted besides other accounts $1,400,000 for depreciation of equipment (which is responsible for most of this amount), structures and tracks.

Of the increase of $9,000,000 in gross earnings, $3,000,000, as already pointed out, was saved for net earnings. Of the remaining $6,000,000, about $2,000,000 was spent for maintenance and $4,000,000 for increase in cost of movement and administration; that is, for conducting transportation and general expenses. The Rock Island was not as successful as the St. Louis & San Francisco in reducing conducting transportation cost. Conducting transportation was 57.07 per cent. of the total expenses, against 55.98 per cent. in 1906 and 58.25 per cent. in 1905. The still more significant ratio of conducting transportation cost to gross earnings was 38.88 last year, as against 38.31 in 1906, and 41.07 in 1905. Thus the actual cost of moving the traffic in a year when the cost of material, supplies and labor was greatly increasing and when there was likely to be that lack of economy which often comes from handling a great increase in traffic, only 0.57 per cent. more of the gross earnings were spent on conducting transportation than in the previous year. This true, there was naturally an increase in the trainload as one of its prime causes. Including all freight, the trainload now lacks only half a ton of being 300 tons. The revenue trainload was 266 tons last year, against 245 tons in 1906. There was also an increase in the average carload.

A year ago there were some startlingly large increases in the tonnage of various individual commodities. The same thing was true last year. The tonnage of wheat increased 40 per cent., of flour 30 per cent., of hay and straw 50 per cent., of cotton 34 per cent., of fruit and vegetables 27 per cent. and of other agricultural products 55 per cent. But grain and oats tonnage decreased so that the increase in the "products of agriculture" group was only 10 per cent. Other large individual tonnage increases were: in coke 55 per cent.; "other mineral products," 306 per cent.; "other castings and machinery," 112 per cent.; petroleum and other oils, 40 per cent.; wagons, carriages, tools, etc., 45 per cent., and household goods and furniture, 38 per cent. Manufactures, as a whole, increased 19 per cent., and merchandise, which includes all less than carload shipments, 17 per cent. The tremendously rapid growth and expansion of the Southwest are clearly evidenced in these figures of increases. The records of the industrial department emphasize the same fact. There were located along the lines of the road during the year 327 new enterprises at an estimated cost of $8,500,000. These are to employ over 8,000 people.

The balance sheet shows that cash stood at $9,900,000 on June 30. Against this, $7,500,000 of three-year notes fell due and were paid off the next day. This would leave a cash balance of $2,400,000. Current liabilities were $11,000,000, against current assets of $10,600,000, including this cash sum. There were, however, $855,000 in fundable advances for construction and equipment, material and supplies on hand valued at $4,400,000 and $10,000,000 in unpledged bonds in the treasury. The transfer of the St. Louis, Kansas City & Colorado to the property and franchises account added $16,900,000 to that item. There was $2,800,000 added in connection with the completion and equipment of the Rock Island, Arkansas & Louisiana.

The Rock Island is still expanding. The new line of the Trinity & Brazos Valley, the present status of which is described in detail in the review of the Colorado & Southern's report, will serve the Rock Island as well as the Colorado & Southern and the St. Louis & San Francisco as a Gulf outlet. The line which the Colorado Southern, New Orleans & Pacific is building between Houston and New Orleans is described in the review of the St. Louis & San Francisco. The Rock Island is to connect with this new line, not only at Houston, but over the Rock Island, Arkansas & Louisiana, which is to be finished to Eunice, La., on the Houston-New Orleans line, this month. The estimated cost of the last 57 miles of this line from Alexandria south to Eunice is a little more than $1,000,000, of which more than half had been spent on June 30, 1907. The new lines in Arkansas connecting this line with the Choctaw division at Little Rock were finished during the year, the branch from Fordyce to Crossett, 57 miles, having been put in operation on February 1, 1907, and the line from Tinsman to Eldorado, 36 miles, on June 23, 1907. These two lines are laid with 60-lb. rail, gravel ballasted and equipped with Rock Island standard bridges and buildings. Just north of Alexandria a part of the Louisiana & Arkansas is to be used under a trackage contract. Completion of the whole line to Eunice will establish a new through route connecting the Choctaw division, the old Choctaw, Oklahoma & Gulf, with New Orleans.

President Winchell speaks as follows in regard to the railroad legislation of the year. The truth of his statement that every opportunity is being taken to establish better relations between the railroad and its patrons is thoroughly borne out by the facts. There is no railroad in the country which is more alive to the necessity and advantages of publicity and frank dealing than the Chicago, Rock Island & Pacific:

> Legislation by the various states which your lines serve, respecting rates and operating methods of railroads, has been excessive in quantity and severe in character. The legislatures of five such states have passed laws establishing two cents a mile as the maximum rate of passenger fare, and other laws have been passed by the several states calling for serious reductions in freight rates. Doubtless a large part of this legislation has been due to misconception of the actual conditions. At every opportunity it is the policy of the officers of your company to endeavor to establish better relations with the people of the various states, and to impress upon them the fact that the progress of the section of the country traversed by your road, and the continued prosperity thereof, require candid co-operation between the railroads and the other business interests. The aim of all must be to promote the welfare of the country, and it is to be hoped that when the situation is thoroughly understood, a spirit of mutual co-operation will be the result.

The following table summarizes the last two years' results on the Chicago, Rock Island & Pacific:

	1907.	1906.
Mileage worked	7,780	7,128
Passenger earnings	$16,449,765	$13,917,031
Freight earnings	40,663,972	34,695,824
Gross earnings	60,238,420	51,237,858
Maint. way and structures.	8,754,397	7,302,490
Maint. of equipment	7,184,128	6,661,466
Conducting transportation	23,420,948	19,630,076
Operating expenses	41,044,142	35,067,059
Net earnings	19,194,278	16,170,800
Net income	8,750,517	6,785,832
Appropriations for betterments	.....	2,108,280
Year's surplus	4,633,789	.....

St. Louis & San Francisco.

A year ago, in reviewing the results of operation of this road, it was remarked that the St. Louis & San Francisco had two great problems: one, to develop a profitable business on a large mileage of new lines in new country; the other, to reduce the proportionate amount of earnings used up by the unproductive expense of conducting transportation. It could not then be known that the Southwest was during the next year to lead all other parts of the country in the rapidity of its growth, a circumstance which solved the first of the St. Louis & San Francisco's problems with great satisfaction. The second was solved by the officers of the road by reducing the proportion of operating income paid out in conducting the business in a year when the ordinary costs of operation were abnormally high.

The years from 1900 to 1905 were a period during which the St. Louis & San Francisco mileage grew by several hundred miles a year. In 1906 there was an increase of only 38 miles and last year there was an actual decrease of seven miles, due to remeasurements and abandonment of small sections of useless track. But the road stands on the threshold of another period of important expansion. On April 30, 1907, it leased for 999 years the Colorado Southern, New Orleans & Pacific Railroad, all of whose stock and bonds it owns. This company owns the Orange & Northwestern and the Beaumont, Sour Lake & Western, and the three roads are together building a through line from Houston, Tex., to Baton Rouge, La., which will be extended by trackage rights over the Yazoo & Mississippi Valley from Baton Rouge to New Orleans. This line, shown on the map of the Rock Island Company's system on another page, is to be in operation by the end of the year. Besides penetrating a local territory productive in cotton and sugar, it will be a competitor as a through line with the Southern Pacific from New Orleans to Houston. The total mileage under construction by the Colorado Southern, New Orleans & Pacific and its subsidiary companies is 303 miles. Including the trackage rights along the Mississippi river, the total mileage will be nearly 400 miles. This is all the construction which is directly at present under way. There are projected, however, a line from Oklahoma City, Okla., south via Lindsay, Ind. T., to Cornish, which is on another projected line from Ardmore, Ind. T., west via Waurika, Okla., to a point near Wichita Falls, Tex.; and an extension of the old Fort Worth & Rio Grande from Brady, Tex., south to San Antonio. Another through line of even greater importance, though it has not involved any direct construction, is the Trinity & Brazos Valley line from Fort Worth and Dallas, Tex., south to Houston and Galveston, giving the St. Louis & San Francisco as well as the Rock Island for the first time a Gulf connection. The Trinity & Brazos Valley will also be a feeder of the Houston-New Orleans line.

Thus the St. Louis & San Francisco will within the next year again have several considerable increases in mileage, this time by through lines in competitive territory instead of, as most of the additions in the recent past have been, lightly built local lines in undeveloped territory. It will be both interesting and important in judging of the future of the property to observe the effect of the acquisition of these two important through lines, of which the Fort Worth extension changes hitherto mainly local lines from Kansas City and from St. Louis south to Fort Worth, into parts of a new through line, on the earnings and detailed operating results. If the result is to secure a much larger proportion of through traffic, the new lines will furnish an element of great strength in regular traffic not dependent largely on the immediate growth and productiveness of the surrounding territory. More of such through traffic the road has always needed.

Last year's record of operations shows gross earnings 20½ per cent., and net earnings 19½ per cent. larger than in 1906; this as already mentioned, with no increase in the operated mileage. Operating expenses, to be sure, increased 21 per cent., faster proportionately than either gross or net earnings, but, largely owing to the reduction in proportion of conducting transportation cost, the net results were as satisfactory as shown. Conducting transportation amounted to 54.72 per cent. of the total expenses, as against 57.15 per cent. in 1906 and 57.9 per cent. in 1905. Its ratio to gross earnings was 35.25 against 36.64 in 1906 and 37.4 in 1905. This showing is a satisfactory one for any year, remarkably so for a year when the cost of conducting transportation on most roads rose more instead of less than any other operating cost.

The decreased proportion which conducting transportation showed to both operating expenses as a whole and to gross earnings was taken up by maintenance of way and structures which was 21.74 per cent. of total expenses, against 19.71 per cent. in 1906, 18.6 per cent. in 1905, and 17.6 per cent. in 1904; and, of gross earnings, 13.99 per cent., against 12.63 per cent. in 1906 and 12 per cent. in 1905. The same policy of greatly improving the property was carried out as on the Rock Island. The average expenditure for maintenance of way and structures per mile of road operated was $1,068, against $799 in 1906, an increase of $269, or 34 per cent., on each of the more than 5,000 miles operated. This is a striking showing of the improvement policy. The cross-tie renewals during the year amounted to 1,439,000; there were 1,186 ft. of wooden trestles filled; 625 ft. of stone or concrete arch culverts substituted for wooden culverts; 200 ft. of timber bridges replaced by steel structures, and 2,515 ft. of iron and steel bridges replaced with heavier steel bridges. Of new rail there were 21,329 tons of 85-lb., 2,788 tons of 75-lb. and 365 tons of 65-lb. laid in main track during the year There were also 132 miles of track ballasted and 194 miles reballasted. These figures, which sum up the principal activities of the maintenance of way department, give an idea of how much has been done.

The equipment also was more liberally maintained than in the previous year. This account, as a whole, increased 24 per cent. Repairs cost $2,508 per locomotive, against $2,313 in 1906; $781 per passenger car, against $761 in 1906; $62 per freight car, against $50 in 1906, and $45 per service car, against $49 in 1906. The net increases in rolling stock equipment during the year were 63 locomotives, four passenger cars, 2,416 freight cars and 844 service cars. In addition, there are being delivered during the last half of the calendar year 90 locomotives, 87 train cars and 5,255 freight cars.

Gross earnings were $38,600,000, an increase of $6,600,000. Of this increase, freight earnings, which increased 22 per cent., furnished $4,900,000, and passenger earnings, which increased 16 per cent., $1,300,000. There was an increase of 26 per cent. in mail earnings, partly due to a new mail service operated in connection with the Missouri, Kansas & Texas.

Operating expenses were larger by $4,300,000. Maintenance of way and structures increased $1,400,000, or 33½ per cent.; maintenance of equipment, $900,000, or 24 per cent., and conducting transportation, $1,900,000, or 16 per cent. The increase in general expenses was 22 per cent. The St. Louis & San Francisco is very fortunate to be able to report a decrease of 5 per cent. in tax payments for the year. The net income available for dividends was 80 per cent. larger than in the previous year, and the dividend payments, owing to the passing of the 2 per cent. dividend on the second preferred stock in 1907, 62 per cent. smaller, so that the surplus after dividends was just under $4,000,000, as against a little less than $1,800,000 in 1906, an increase of 121 per cent. There was charged to the general profit and loss account $625,000 as depreciation in the value of buildings torn down, tracks taken up and equipment destroyed and dismantled during the year, the balance of the cost less salvage, being charged to operating expenses.

Freight earnings per mile of road rose from $4,331 to $5,304. The trainload was 224 tons, against 214 tons in 1906, a small increase. This is a road with a great network of branch lines which carry light traffic. The bulk of the business is traffic of this character; therefore an increase in the trainload is much harder to accomplish than on a heavy traffic road with through business, where it is necessary only to cut down the ruling grade or acquire heavier power to raise the number of tons carried per train mile.

There were increases of 21 per cent. in the tonnage of agricultural products, 15 per cent. in mineral products, 14 per cent. in forest products and 24 per cent. in manufactures. Wheat tonnage increased 36 per cent.; hay and straw, 52 per cent.; cotton, 16 per cent.; dressed meats, 69 per cent.; wool, 163 per cent.; bituminous coal, 16 per cent.; "other mineral products," 107 per cent.; petroleum and other oils, 45 per cent.; pig and bloom iron, 44 per cent.; "other castings and machinery," 46 per cent.; bar and sheet metal, 106 per cent.; wagons, carriages, tools, etc., 90 per cent.; household goods and furniture, 21 per cent., and "other manufactures," 29 per cent. The merchandise tonnage increased 11 per cent. and miscellaneous, including all carload shipments of commodities not separately mentioned, 45 per cent. The similarity of some of these individual increases to corresponding ones on the Rock Island will be noticed. The industrial department reports almost the same number of new industrial plants as those that located on the Rock Island lines during the year. The new industries on the St. Louis & San Francisco tracks number 338, cost about $9,000,000 and employ over 12,000 men. These figures are all further testimony to the great prosperity of the Southwest.

The balance sheet shows current liabilities of $13,600,000, against strictly current assets of $12,240,000. There are in addition fundable construction advances amounting to $865,000, supplies on hand amounting to $2,870,000 and unpledged securities in the treasury which cost $4,100,000. This company like the Chicago, Rock Island & Pacific is in no immediate straits for new capital, but if it were is possible to do so on reasonable terms could at once profitably enlarge its working capital.

The following table shows the operating results of the St. Louis & San Francisco, not including the Chicago & Eastern Illinois:

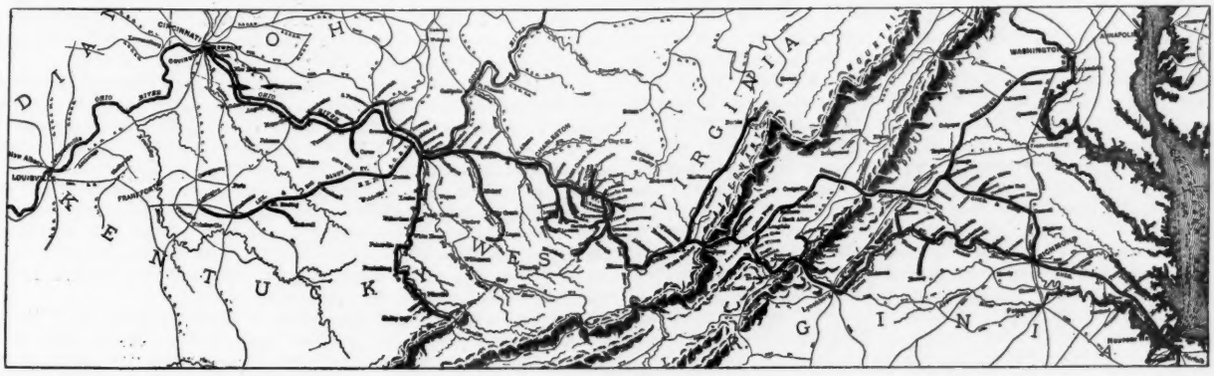
	1907.	1906.
Mileage worked	5,062	5,069
Passenger earnings	$9,169,400	$7,908,644
Freight earnings	26,848,665	21,955,975
Gross earnings	38,621,068	32,046,657
Maint. of way and struct.	5,406,107	4,049,094
Maint. of equipment	4,699,674	3,803,211
Conducting transportation.	13,610,703	11,742,742
Operating expenses	24,872,579	20,545,533
Net earnings	13,748,488	11,501,123
Net income	4,158,583	2,309,136
Dividends	199,742	519,742
Year's surplus	3,958,841	1,789,394

Chesapeake & Ohio.

A change has taken place during the last year in the operating results of the Chesapeake & Ohio. The year ended in June, 1906, was far and away the most prosperous in every way in the company's history. Gross earnings increased 19 per cent. and net earnings 26 per cent. over the 1905 year, which itself was very prosperous. Last year, although gross earnings increased 5 per cent., there was a decrease of nearly $600,000, or 5½ per cent., in net earnings. As charges sharply increased, owing largely to an increase of 29 per cent. in taxes and the greater amount of equipment bonds outstanding, the year's final contribution to the profit and loss account was only a nominal one, instead of a surplus of nearly $1,500,000 as in 1906.

Gross earnings were affected unfavorably by the hard winter. Operating expenses were much increased by the rise in cost of materials and a general increase in wages. Furthermore, traffic on the lines in West Virginia and Kentucky was frequently interrupted by land slides and by river floods, the train service on the Cincinnati division having at one time been suspended for a week.

The Chesapeake & Ohio, like the Norfolk & Western, its near neighbor from the Ohio river to tidewater, and, for that matter, many other railroads, is at present in a discouraging situation. Great quantities of traffic are offering. The company has been and is hard put to it to provide enough equipment to meet this traffic. Even with the equipment provided, the necessities of the case are not met, for the existing lines, mostly single-track, are inadequate to promptly and efficiently handle the rush of traffic. More double-track is urgently needed. Gross earnings, to be sure, are increasing, but already the increases are more than eaten up by the rising cost of operation. Locomotives cost more, cars cost more, lumber costs more, general supplies cost more; in particular, labor costs more, while at the same time it is generally less efficient. In this



Chesapeake & Ohio.

situation the company is met with state laws reducing rates. Furthermore, its main hope of solving its problems—the extension and improvement of its plant through expenditures on capital account—is taken away by the fact that it cannot sell bonds.

In commenting on this situation President Stevens calls attention to the fact that while the road last year earned more than 5 per cent. on its stock, the shareholders' dividend was only 1 per cent., a rate never exceeded since the formation by reorganization of the present company in 1888. Instead of distributing a fair share of profit to its owners, the company, in order to meet the needs of its shippers, has been compelled to apply its whole surplus income beyond the 1 per cent. dividend payment to buying additional equipment and furnishing more traffic facilities. But even by doing this, all of the vitally needed improvements cannot be carried out. Of 98 miles of new second-track authorized during the previous fiscal year, only 24 miles have been finished. Work on the rest has been stopped because the company cannot borrow the $1,315,000 necessary to finish the suspended work.

President Stevens next contends, and it would seem with justice, that the traffic of the road has not been burdened by excessive rates. An average passenger-mile rate of 2⅛ cents is low for a road most of whose mileage is in Virginia, West Virginia and Kentucky, and which has little or no commutation traffic to bring down the average rate. Still more true is this of the rate received per ton per mile for freight which was only 4⅓ mills last year, one of the lowest ton-mile rates on any railroad in the country. Assuming the further fact, which is confirmed both by a study of the report and a knowledge of the working of the property—that the road has been efficiently and economically managed, he reaches the conclusion that the return to the owners of the property has been entirely inadequate; so small that it would not be justified in any kind of business.

Mr. Stevens continues as follows:

"It would, therefore, seem to be to the interest of the communities and people served by your lines, that your revenues should not be lessened or your credit injured, by further reducing rates that are now inadequate to meet the physical requirements of the property and yield the return which you, as shareholders, may rightfully and reasonably expect. It seems clear that with all the leading railroads in the section served by your lines, the time has arrived when the increased volume of traffic is forcing on them exceptionally large expenditures for double track, equipment and yard facilities, and, as the commonwealths through which they pass can only prosper through continued development of the mineral and other industries which are served by the railroads, it necessarily follows that any legislation which injures their credit and prevents the sale of securities at fair prices, must work as great a loss to the people as to the railroad shareholders. It is believed that the communities along the lines of the system must in the end recognize the accuracy of this statement."

There was an increase of 5 per cent. in the tonnage of coal and coke which together make up 61 per cent. of the road's traffic. Strangely enough in a year of such very general prosperity all other freight traffic increased almost not at all. There was a small decrease in ton mileage, but as the revenue per ton-mile was slightly larger, the freight earnings increased 3 per cent. There was a decrease of 2 per cent. in the freight density.

The revenue trainload rose from 586 to 596 tons. Including company freight the figure was 628 tons. These figures exceeded only by the Great Northern and short roads like the Bessemer & Lake Erie and the Pittsburgh & Lake Erie, which connect the iron and steel centers of the Pittsburgh district with the ore docks on the Lakes.

There were much larger proportionate increases in the passenger department. Passenger earnings increased 15 per cent. and passenger density 12 per cent., while passenger earnings per mile of road were 13 per cent. larger, rising to $2,675. Passenger earnings per train-mile, however, increased only 1 per cent., while freight earnings per train-mile were 4 per cent. larger.

The total increase in operating expenses was $1,780,000. Of this, $1,050,000 was in conducting transportation, the operating division of which account increased 14 per cent. Maintenance of way and structures increased $440,000 and maintenance of equipment $252,000, thus reversing the experience of many other railroads last year whose maintenance of equipment cost increased far more than maintenance of way. Per mile of line, maintenance of way cost $1,691, against $1,447 last year. It is therefore evident that the road has been well kept up, especially as about $1,000,000 of the extraordinary expenditures for the year was on maintenance of way betterments. The cost of repairs per unit of equipment was $1,973 per locomotive, against $2,114 in 1906; $1,047 per passenger car, against $1,091 in 1906, and $87 per freight car, against $94 in 1906. The passenger car figure for both years is high.

Even including materials and supplies, which stood at $2,240,000 on the balance sheet on June 30, 1907, current assets were $1,700,000 less than current liabilities. Excluding this item, the current assets were $1,700,000 less than the one liability item "unpaid vouchers and pay rolls." Last fall there were reports that the directors were planning to rearrange the company's finances in such a way that a large general bond issue available for improvements and extensions would be created. The Chesapeake & Ohio has been much handicapped by the fact that it had few bonds of uncompleted issues available. Most of its new construction has been financed by means of branch-line bonds. The stock market debacle of last spring probably prevented the formation of such a general and inclusive financial plan. To take care of immediate needs, however, the directors resolved on June 14, 1907 to recommend the creation of $10,000,000 general equipment and improvement 10-year 5 per cent. bonds. This mortgage was unanimously authorized at a special meeting of the stockholders on July 31. As of July 1, $5,000,000 three-year 6 per cent. notes secured by $6,500,000 of these bonds were sold. The proceeds of these notes would, therefore, offset the excess of current liabilities over assets as of June 30, 1907. It is obvious, however, that this note issue does very little toward providing for the general expansion needs of the company and that once

investment conference is re-established, a general and comprehensive finance plan is likely to be adopted.

The following table sums up the last two years' operations:

	1907.	1906.
Mileage worked	1,827	1,793
Passenger earnings	$4,888,139	$4,242,556
Freight earnings	19,974,861	19,395,648
Gross earnings	25,796,861	24,602,988
Maint. way and structures	3,090,037	2,649,557
Maint. of equipment	4,721,346	4,469,590
Conducting transportation:		
Traffic	482,444	434,755
Operation	7,955,064	6,959,355
Operating expenses	16,650,307	14,869,649
Net earnings	9,146,554	9,733,339
Net income	3,392,999	4,607,223
Improvements and equipment	2,684,221	2,532,739
Years' surplus	61,071	1,426,577

Colorado & Southern.

This is a period of great expansion for the Colorado & Southern, which was organized from two branch lines which were lopped off from the old Union Pacific property when the present Union Pacific was formed. These were the Denver, Leadville & Gunnison and the Union Pacific, Denver & Gulf. The latter turned back to the Union Pacific the Julesburg branch by which the Union Pacific now gets its entrance from the east to Denver, on the formation of the Colorado & Southern, which began operations with 1,537 miles of line, including the Fort Worth & Denver City Railway, which it controlled through ownership of a majority of its stock. This brought the system to Fort Worth, Tex. Here it stopped for eight years. The present year has seen, or will see, its extension to Houston and to the Gulf at Galveston, the second largest port of export in the country.

This new construction, which is shown on both the Colorado & Southern and the Rock Island Company maps in this issue, has been carried on through the Trinity & Brazos Valley, a subsidiary corporation, all of whose issued and to be issued stock and issued bonds are owned jointly by the Colorado & Southern and the Rock Island Company, controlling the Rock Island and the St. Louis & San Francisco. Operation of the line from Fort Worth to Houston was begun on February 10, 1907, and on July 1 the Dallas connection with this line was opened. By the close of the year 1907, trains will be operated into Galveston. Construction work is still going on north of Houston in order to prepare the road to handle efficiently the large amount of business which is likely to fall to it. That the business will be large is not a doubtful expectation, for, as mirrored in the joint ownership of the Trinity & Brazos Valley, it is to be used, both from Fort Worth and from Dallas, as a Gulf connection for the Rock Island and the St. Louis & San Francisco, as well as for the Colorado & Southern. Besides, the new lines open up new country and are the shortest railroads between Fort Worth and Galveston and between Dallas and Galveston.

At Fort Worth the Trinity & Brazos Valley uses the terminals of the Fort Worth & Denver Terminal Railway, while at Dallas temporary arrangements have been made with the St. Louis Southwestern. At Houston temporary arrangements have been made for use of the Santa Fe terminals, supplementing the terminal facilities of the Houston Belt & Terminal Railway, now in course of construction. This terminal railway is jointly controlled by the Trinity & Brazos Valley, the Santa Fe, the St. Louis & San Francisco, and the St. Louis, Brownsville & Mexico. At Galveston terminals are being built by the Galveston Terminal Railway, organized and controlled by the Trinity & Brazos Valley. Galveston is reached from Houston by trackage contract over 53 miles of Santa Fe tracks. Operation of this line by the Trinity & Brazos Valley is to be begun this month, while all of the authorized terminal construction at Galveston is to be finished this fall. The total operated mileage of the Trinity & Brazos Valley will then be 422 miles. There had been advanced by the Colorado & Southern up to June 30, 1907, $190,000 for terminals at Fort Worth, $127,000 for terminals at Dallas, $197,000 for terminals at Houston, and $111,000 for terminals at Galveston. In each of the last two cases the same amount had been advanced by the Rock Island Company.

The Trinity & Brazos Valley lines, of which 272 miles were in operation on June 30, are not included in the Colorado & Southern returns. There was, however, a considerable addition to the mileage during the year through completion of the Wichita Valley lines, whose complete operation dates from January 1, 1907. This is a branch line 175 miles long, running from Byers, Tex., on the Red river, across the Fort Worth & Denver City at Wichita Falls, and then southwest and south to Abilene, Tex., on the Texas & Pacific.

The Colorado & Southern has also been expanding in Colorado north of Denver, where 37 miles of branch lines were built during the year, 17 miles by the Fort Collins Development Railway and 20 miles by the Colorado Railroad. In addition, a line 18 miles long, to serve the important territory between Denver and Boulder and the coal mining camps about Boulder, is being built by the Denver & Interurban Railroad. This is to be finished by next spring. It will permit operation of 44 miles of line in all by electricity for frequent passenger service. A map and description of this project was printed in the *Railroad Gazette* of June 21, 1907. The Denver & Interurban is also building an electric passenger line in Fort Collins, Colo., which is to be in operation by December. Advances up to June 30, 1907, to these various companies, were as follows: Fort Collins Development Railway, $50,000; Colorado Railroad, $172,000; Denver & Interurban, $254,000.

Not the only expansion of the year was in mileage. The income account shows large increases in earnings. Gross earnings were $13,500,000, an increase of $1,800,000, or 15 per cent.; operating expenses increased $1,300,000, or 17 per cent., and net earnings were $4,200,000, an increase of $500,000, or 12 per cent. The net income for the year was over $2,000,000, an increase of 18 per cent. over 1906. As was natural with such a showing, dividends were begun on the $8,500,000 second preferred stock. The first payment ever made on this issue—2 per cent.—was paid April 1, 1907. Four per cent. was also paid on the $8,500,000 first preferred, against 2 per cent. in the previous fiscal year and nothing in 1905.

Freight earnings increased 13 per cent. and passenger earnings, as well as express, mail and miscellaneous earnings, each increased 22 per cent. The average ton of freight was carried further and paid more per mile. The increase in the average distance carried, from 134 to 151 miles, is a prophecy of what is likely to happen as soon as the Gulf extension is completed and in smooth working order. It is highly probable that not only will there be a large export traffic by this line, but also that a considerable proportion of the shipments from the East to Colorado will go by steamer to Galveston, thence north over the Colorado & Southern lines. The average passenger was carried 47 miles, against 42 miles in 1906, and paid slightly more per mile than in that year. The gross earnings per mile of road increased from $7,007 to $7,244, while the net earnings per mile of road were about the same as in the previous year, $2,266, against $2,256 in 1906. Taxes per mile of road decreased, which is a more fortunate experience than most railroads can boast of during the year just passed.

Of the increase in operating expenses, maintenance of way and structures furnished $267,000, an increase of 14 per cent.; maintenance of equipment, $250,000, an increase of 15 per cent., and conducting transportation, $788,000, an increase of 20 per cent. Largely on account of this last item, the operating ratio rose from 68 per cent. to 69 per cent. The principal increases under this head were in locomotive fuel, train service, station service and car mileage. There was an increase of 82 per cent. in the item of lost and damaged freight, and of 62 per cent. in the item of injuries to persons. The cost of clearing wrecks rose from $42,000 in 1906 to $59,000, an increase of 42 per cent.

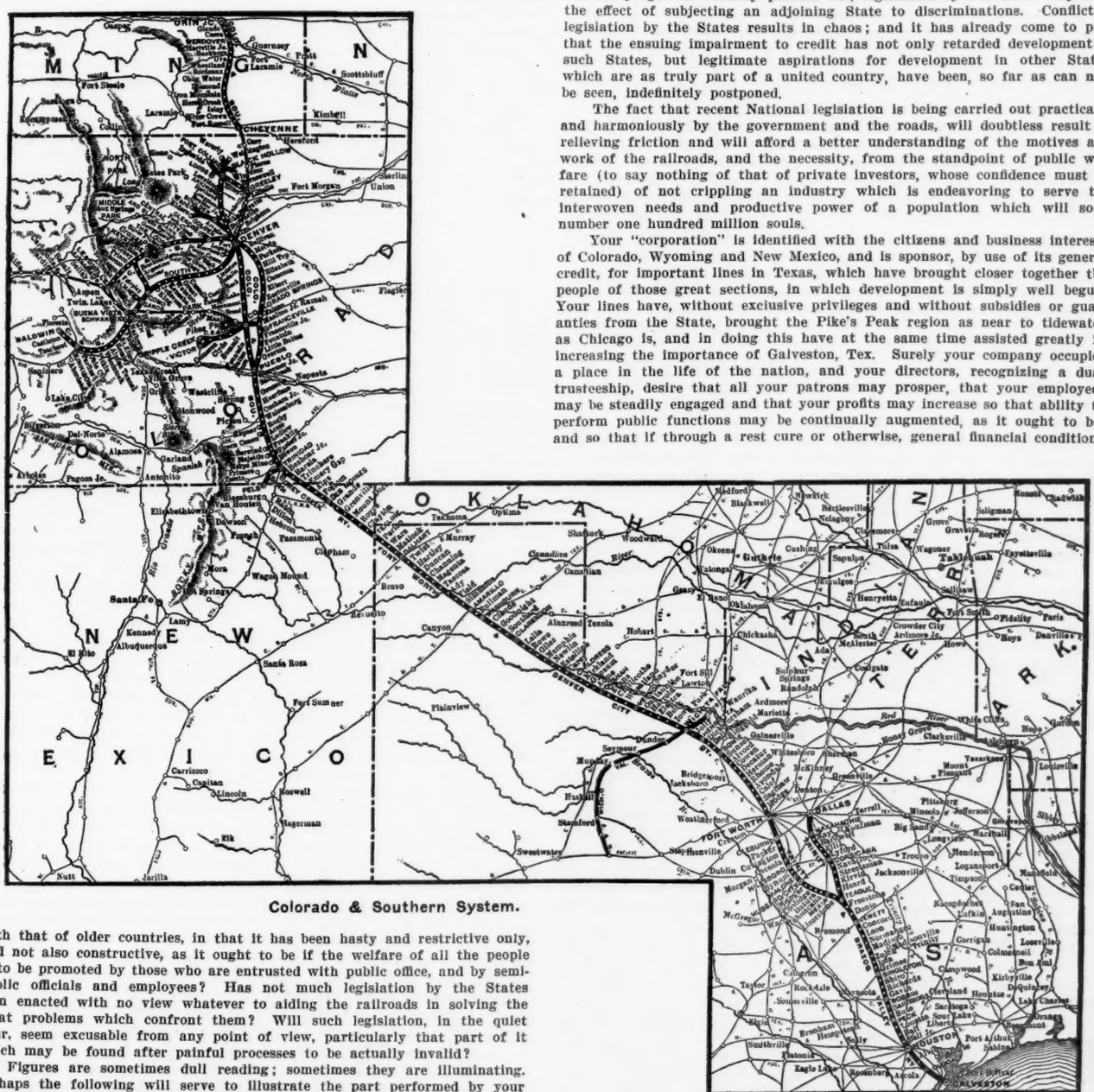
Maintenance expenditures were in general more liberal than in the preceding year. Per mile of road owned, maintenance of way cost $1,238, against $1,178 in 1906. There were 167 miles of new rails laid, against 128 miles laid last year, all of 77-, 80- or 85-lb. steel. Over 800,000 ties were laid, as against 550,600 in 1906. Maintenance of equipment per unit of equipment owned at the beginning of the fiscal year cost $2,725 per locomotive, against $2,509 in 1906; $796 per passenger car, against $832 in 1906, and $79 per freight car, against $66 in 1906. Especially as 386 of the 1,858 miles of the Colorado & Southern are narrow gage line, and a similar proportion of equipment is narrow gage, these are liberal maintenance figures.

The principal item of the Colorado & Southern freight traffic is mineral products, of which 4,440,000 tons were carried last year bringing in a revenue of $4,280,000, being 63 per cent. of the total tonnage and 44 per cent. of the total revenue, as against 67 per cent. and 47 per cent., respectively, in 1906. There was a great increase in lumber traffic during the year. The lumber tonnage rose from 133,000 tons, bringing in a revenue of $609,000 in 1906, to 488,000 tons, with a revenue of $811,000 last year. The 1906 tonnage was 2 per cent. of the total, and the revenue 7 per cent. of the total, while last year, with a tonnage equal to 7 per cent. of the total, the revenue was a little more than 8 per cent. of the whole. The added lumber tonnage must have been carried at much lower rates. Although the agricultural tonnage remained at about the same proportion, there were one or two noticeable increases, in particular in cotton, fruit and vegetables, and potatoes. Fruit and vegetables, which furnished nearly 5 per cent. of the tonnage, yielded only 2 per cent. of the total revenue, while potatoes, with a little over 1 per cent. of the tonnage, brought in nearly 5 per cent. of the total revenue. This apparent anomaly is probably due to the fact that most of the fruit and vegetables were carried only a short distance, while Colorado potatoes were shipped south to Texas. The total tonnage was 7,090,901 tons, against 6,245,948 tons in 1906.

Under the heading "Public Service," President Trumbull gives his views in regard to the relation of railroad companies to the public. His remarks in full are as follows:

Railroad companies have for years led all corporations in publicity, and in an annual report like this, some allusion to your company's attitude

toward current economic discussions may properly be included. Much has been said, of late, concerning the shortcomings of corporations. It is doubtless true that they have not been infallible; but have they in that respect been in complete isolation? If one looks at the vast field served by railroads, the greatly diversified interests they have to satisfy and contend with, and the army of over one and one-half million employees, which, like all armies, must have efficient leaders and thorough discipline if safety and success are to be achieved; and if one considers that the development of the country and its business growth have been so rapid that it has been impossible for other industries to keep pace with it, is it not remarkable that the railroads are meeting, as well as they are, the demands made upon them without a substantial increase in rates, particularly as the cost of everything which goes into their construction, improvement, maintenance and operation has enormously increased? Within the past year a multitude of laws have been enacted for the regulation of railroad companies. In view of the valuable and far reaching public services that must be performed by them, may it not be true that much of such legislation has been amateurish, in comparison



Colorado & Southern System.

with that of older countries, in that it has been hasty and restrictive only, and not also constructive, as it ought to be if the welfare of all the people is to be promoted by those who are entrusted with public office, and by semi-public officials and employees? Has not much legislation by the States been enacted with no view whatever to aiding the railroads in solving the great problems which confront them? Will such legislation, in the quiet hour, seem excusable from any point of view, particularly that part of it which may be found after painful processes to be actually invalid?

Figures are sometimes dull reading; sometimes they are illuminating. Perhaps the following will serve to illustrate the part performed by your company the past year, in its capacity as a public servant:

The number of passengers carried was 2,801,699, at an average rate of 2.44 cents per mile—a trifle more than a two-cent postage stamp—and this partly in a section where physical operations are most difficult and where wages are probably the highest in the world. Compare this, for example, with England and Wales, with an area of 58,000 square miles (about one-half of Colorado or about one-fifth of Texas), where the number of passengers carried is more than in the whole 3,025,000 square miles of the United States. In England, with much lower wages, the regular third-class rate is two cents per mile, and first-class passengers (only 3 per cent. of the total) pay over three cents. The railroad mileage of Great Britain is about one-tenth of that of the United States, but it carries nearly one-half as much capitalization.

The number of tons of freight carried by your company during the year was 7,090,901, at an average cost to the shipper of 1.05 cents per mile—2,000 lbs. carried one mile for about the equivalent of a one-cent postage stamp. You distributed during the year:

For labor and material employed in productive operations over		$9,000,000
(An increase over the previous year of more than $1,300,000.)		
For taxes, over	335,000	
For improvements and new equipment, over	4,400,000	
For new construction, over	6,600,000	
		$20,335,000
To investors for interest, a little less than		2,000,000
To investors for dividends		510,000

Doubtless two-thirds or more of the payments for material and for improvements, new equipment and construction went to labor in one form or another.

Legislation affecting the vast transportation necessities and interests of a unified country should, like that of older countries, protect, as well as supervise; for duty is reciprocal and is not bounded by State lines. As a Federal judge has recently pointed out, legislation by one State may have the effect of subjecting an adjoining State to discriminations. Conflicting legislation by the States results in chaos; and it has already come to pass that the ensuing impairment to credit has not only retarded development in such States, but legitimate aspirations for development in other States, which are as truly part of a united country, have been, so far as can now be seen, indefinitely postponed.

The fact that recent National legislation is being carried out practically and harmoniously by the government and the roads, will doubtless result in relieving friction and will afford a better understanding of the motives and work of the railroads, and the necessity, from the standpoint of public welfare (to say nothing of that of private investors, whose confidence must be retained) of not crippling an industry which is endeavoring to serve the interwoven needs and productive power of a population which will soon number one hundred million souls.

Your "corporation" is identified with the citizens and business interests of Colorado, Wyoming and New Mexico, and is sponsor, by use of its general credit, for important lines in Texas, which have brought closer together the people of those great sections, in which development is simply well begun. Your lines have, without exclusive privileges and without subsidies or guaranties from the State, brought the Pike's Peak region as near to tidewater as Chicago is, and in doing this have at the same time assisted greatly in increasing the importance of Galveston, Tex. Surely your company occupies a place in the life of the nation, and your directors, recognizing a dual trusteeship, desire that all your patrons may prosper, that your employees may be steadily engaged and that your profits may increase so that ability to perform public functions may be continually augmented, as it ought to be, and so that if through a rest cure or otherwise, general financial conditions in America again improve, your company's sphere of influence may seem to capital and enterprise an inviting field for further expansion.

The following table sums up the last two years' operations:

	1907.	1906.
Mileage worked	1,858	1,663
Passenger earnings	$3,173,856	$2,603,691
Freight earnings	9,723,962	8,592,527
Gross earnings	13,456,489	11,653,446
Maint. way and structures.	2,226,504	1,959,184
Maint. of equipment.	1,769,803	1,519,913
Conducting transportation	4,807,630	4,019,982
Operating expenses	9,246,919	7,902,212
Net earnings	4,209,571	3,751,234
Net income	2,216,146	1,766,212
Dividends	510,000	170,000
Year's surplus	1,328,689	1,221,056

NEW PUBLICATIONS.

State Railways: Object Lessons from Other Lands. By Edwin A. Pratt, with a translation of M. Marcel Peschaud's articles on Les Chemins de Fer de l'Etat Belge, in the *Revue Politique et Parlementaire.* London: P. S. King & Son, 1907. Paper; one shilling.

We know of no other publication in which the observer of railroad conditions can get for a shilling as many arguments against government ownership as in this concise little book by Mr. Pratt, already well known for his clear and scholarly studies on transportation topics. Just half the book is devoted to condensed comment—sometimes rather too condensed, it must be admitted—on government ownership in Belgium, Prussia, Denmark, Italy, Australia and New Zealand; the balance is a translation from the French of M. Peschaud, who discusses Belgian railroad conditions in detail. Mr. Pratt, in his general comments, cites examples of the well known objections to government ownership; inflexibility of rates and service; subjection to political influence; high cost of operation; bureaucracy; use of railroad employees to build up a political machine; bad bookkeeping, etc. For example, he quotes Sir Joseph Ward, the New Zealand Premier, as to the fact that goods rates could not be levied until they had been passed upon by the Governor in council, who, also, alone could modify them.

"If you wanted to carry 10,000 tons of cheese for 100 miles," said Sir Joseph, "and if the freight for cheese was 7s. 6d. per mile, you would be charged 7s. 6d. for each ton of the consignment, just as you would for one or two tons; no one could vary the charge." Mr. Pratt rightly comments that if a railroad can afford to carry a single ton of cheese a hundred miles for 7s. 6d., it can well afford to carry a consignment of 10,000 tons the same distance for a lower amount per ton, and that in New Zealand the wholesale man is, in effect, penalized, in order that the retail man shall have no possible excuse for cherishing a grievance against the politicians who control the operation of his state railroads.

Mr. Peschaud shows that of a total of 2,637 miles of railroad in Belgium, all but 344 miles is operated by the state. He criticises the state working on the grounds that train service is bad and speeds are low; the state operation does not economize in the least; it is bureaucratic and involved in much red tape; it is worked neither on commercial nor on industrial lines; the work done by government employees is less efficient, often by one-third, than the work done by private employees; the system has no flexibility, and breaks down in emergencies; the government has gradually made itself less and less amenable to damage claims; it aims to give satisfaction to those without real, but with electoral interests; the number of the staff on the state railroads is 152 per kilometer, as against 107 on the private railroads; the promotion of employees rests on political considerations; the capital accounts have been altered until they are purely fictitious. Further, the government is a poor bargainer, and pays far higher prices for its supplies than the private managements do, and, in 1905, the total proportion of expenditure to receipts was 45 per cent. on the Belgian lines worked by companies and 61.97 per cent. on the lines worked by the government.

Locomotives, Simple, Compound and Electric. By H. C. Reagan. New York: John Wiley & Sons. 932 pages; 5½ in. x 8 in.; 494 illustrations. Cloth. $3.50.

To quote from the preface; "the author, who is a practical engineer, attempts in this book to write a treatise on the locomotive engine, and has tried to describe the manner in which the locomotive is handled while in service." In a way he has succeeded, though to dignify it as a "treatise" is to somewhat stretch the courtesy of the word It is rather a description of various types of locomotives and certain appliances used thereon, than a book to convey an idea of the construction and working of the locomotive to one who is not familiar with the subject. So much has been published regarding locomotive construction that the author passes lightly over the usual descriptions, using a somewhat original order of treatment and stows away in the first 100 pages all that he has to say of the front end, cylinders, frames, rods, rod accidents and valves and their setting, to each of which a chapter is devoted, and a liberal portion of even this space is given up to examination questions on the subject. He very truly observes that a man "will learn more by watching repairs, etc., * * * than if the method were described in so many words." So the book apparently makes no attempt to show and describe the construction of the various parts, but merely calls attention in many cases to peculiarities of construction, so that it would serve as a good guide if it were to be read in the presence of the locomotive and the several items mentioned were to be studied as they were brought up.

Following these general descriptions, there is a long chapter on compound locomotives. In this no attempt has been made to discuss the subject from the theoretical or practical standpoint of operation. There is not a word of introduction to the chapter, but the reader is plunged at once into a description of the several types of compound locomotives that have been presented for consideration. Some of these have held their own on the basis of the survival of the fittest, others have been withdrawn from the market and converted; while others were almost stillborn. In this respect the chapter will serve as a work of reference for those who wish to study the variations in type without entering into the details of the construction. In these descriptions there are also included a number of foreign locomotives that have never been built in counterpart in the United States, thus making the chapter all the more valuable for the purpose for which it is especially adapted. After this there follows a short chapter on superheaters, very short, in fact, when the importance of the subject and the interest that it is attracting is taken into consideration.

The chapter on air-brakes is one of prominence, but is defective in that it ignores the latest development of the Westinghouse triple-valve with the delayed release and special recharging features. It would be interesting also to learn why the author splits his treatment of the boiler into two chapters separated by hundreds of pages, instead of putting the whole subject together.

The book closes with descriptions of a number of electric locomotives preceded by a sketch of the general features of electric current generation. In this the author does not appear to be thoroughly at home. Not that there are appreciable errors but the language is not that of a man who is a master of the subject. Still this section of the book is worth while as a reference.

Taken as a whole the book may be regarded as a very useful hand-book of the locomotive, to be used for reference and a guide to a more thorough study as pointing out what has been done and the principal appliances that are used on the ordinary American machines.

The Railroad Problem.*

BY ROBERT MATHER.

If the rails of the land should melt over night, the loss tomorrow morning would be less in the falling quotations of railroad bonds and stocks than in the utter destruction of the values on farms and in mines and mills and factories that to-day we count as the nation's wealth. Such sudden and miraculous solution of the problem is, of course, unlikely; at least it has not yet been advocated in Presidential speech or message. But any diminution of the industrial efficiency of our transportation lines would affect in like manner, though in lesser degree, all the varied interests that would go down to destruction with the annihilation of those lines. It is not alone, therefore, the few thousands who own the securities of the railroads, or the million and a half employees engaged in their operations, or the ten millions whom the wages of these employees support, that are directly and peculiarly interested in the proper solution of the railroad problem. The question comes home as well to the pockets of the millions of farmers and miners and millers and manufacturers and merchandisers, with all their added millions of dependents. In short, it is a question that touches us all, not because the charge for transportation is a large element in the cost of what we consume, but because without efficient railroad transportation our commerce could not be profitable. The gross earnings of all our railroads for the fiscal year ending June 30, 1907, were $2,325,765,167. Divided among the population this would be $25 each. A 33⅓ per cent. reduction in freight and passenger rates would mean $8 per annum for each of us, but a reduction by one-third of the capacity of our transportation lines to move the tonnage of the country would mean ruin to us all.

This critical generation would do well to recall how our railroads have been created. Upon the invention of the steam engine the industrial world faced a difficult situation. It had from time immemorial been the practice and the accepted duty of the state to provide and to maintain the highways upon which the citizen might either haul his own freight, or as a common carrier transport the persons and property of others. But the new style of iron highways that the steam engine had introduced was expensive to construct. States were poor, their revenues insignificant and their credit correspondingly bad. Many shrank entirely from the risk that the new task offered; others undertook the work and early became involved in debt, in loss and in shame. In this predicament private enterprise was given the opportunity to undertake the duty which the states themselves were unable to perform. That is, the states employed private capital, on certain terms, to build the highways which the states should have built for the people's use. One of the terms of this employment was that the corporation that built the highways should alone have the right to operate trains over it, and that the public could use the highway for the movement of their goods or persons over it, only under rules and regulations and rates prescribed by the corporation. This worked a restriction upon that free use of the common highways to which the citizens of the state had heretofore been accustomed. For, while any one could carry on the occupation of a common carrier over the ordinary highways of the state, only one common carrier—namely, the corporation that had built it—was permitted to conduct the business of a common carrier on this new kind of a highway. But it had never been the

*From an address before the Chicago Association of Commerce, Oct. 12, 1907.

duty or the function of the state to be a common carrier. The corporation, then, though it exercised a function of the state in *building* the highway, did not exercise a public function in transacting over it the business of a common carrier. That was, always has been, and is to-day a private occupation. It is true it is an occupation with respect to which the law has always exercised certain rights of regulation, but it is not on that account a public function any more than the conduct of the business of an inn-keeper, a miller, a hackman or an auctioneer, with respect to which the law exercises the same right of regulation, is the exercise of a public function.

To undertake a task too vast and perilous for the state itself to perform, there must have been held out to private enterprise the hope of a far greater reward than a mere interest return on its investment. And such hope was held out. While it was then the law, and therefore a part of the bargain between the state and the corporation, that the carrier should charge only a reasonable rate for the service of transportation, it was clearly contemplated by both parties that great values beyond the actual cost of building and equipping the line might flow from the successful carrying out of the scheme. That hope was capitalized by the issuance of shares of stock beyond the face amount of the cash expenditure. If the plan succeeded the hope was realized either in the sale of the shares or in the payment of dividends upon them. If the plan failed, as it often did, the hope was dashed and the certificates that represented it became worthless paper.

Now, let us suppose that the states, in making their bargain with private capital for the building and operation of these public highways, had said to the proposed builders:

"You will not be permitted to issue bonds and stock in face amount greater than your actual expenditures;

"You will never be permitted to make more out of this project than 4 per cent. per annum upon the money actually invested;

"You will, however, be taxed upon the actual value of your property, as ascertained from time to time, and, if your securities find favor in the market and reflect greater than actual values, taxes will be levied upon that basis;

"The state will prescribe the methods of keeping your accounts and will examine them at its will;

"The state will determine the number of trains you shall run and designate the stations at which they shall stop;

"The state will prescribe the number of men you shall employ in operating your trains, and will fix their hours of labor and the conditions of their employment;

"The state will establish rates of fare and of toll from time to time at its arbitrary discretion, without consideration of their reasonableness;

"If any other methods of regulating you occurs to the state hereafter, they will be adopted;

"You will accept without objection all regulations now or hereafter imposed by the state, and if you appeal for the protection of the federal constitution to the federal courts, the state will revoke your charter."

All this and more the states have said to the railroads in recent or in threatened legislation. Had the states been as frank and specific when bargaining with the corporations that were planning to build these public highways, there would have been presented a beautiful exemplification of the principles of the square deal, but it is doubtful if the railroads would have been built.

After completing its compact with the state, the railroad corporation began the construction of its line. With rare exceptions it spent its money not on the faith of things that were, but in the hope of things to be. Our railroads were almost uniformly built, not like those of Europe, from market to market, through industrial communities long established, with tonnage awaiting them at every stage from starting point to terminus, but into the comparatively unsettled and often untracked lands of the future. Their cities were largely unfounded, their factories unbuilt, their mines unopened and their farms unpeopled. Their revenues were not in sight, except to the eye of faith and courage.

They built their lines to suit their situation. They chose the easiest path through the territory they were to serve. Grades and curvature conformed largely to the contour of the country. Highways were crossed at grade and streams on wooden trestles. Light steel was laid in a single track, and ballast dreamed of but forgotten. The cost of terminals in such cities as there were prohibited provision for the future, and only such facilities were acquired as were needed for the traffic immediately in sight. Some light engines and a minimum of cars of small capacity were acquired, and the railroad was "completed"—and put in operation.

The cost, of course, had exceeded the estimates, and a floating debt stood between the stockholder and his dream of dividends. Hardly, too, had the operation of the railroad started before it was realized that the "completed" line was barely begun. As the lands were settled and the cities grew, and the mines and mills began to turn out their product, it was found that the single track, with its light rails, its heavy grades and curves and its inadequate terminals and equipment could not move the traffic it was built to serve. The task of enlargement, improvement and rebuilding was begun. Grades were reduced, curvature cut out, bridges rebuilt in steel, heavy rails laid down, the line double-tracked, the roadbed ballasted, grade crossings eliminated, heavier motive power and rolling stock acquired, and vast terminals, at multiplied cost, bought in the hearts of cities that, when the rails were first laid, were villages or passing tracks.

But the railroads could not rebuild and enlarge their facilities as fast as the traffic grew. In the decade from 1896 to 1906 the railroad mileage of all tracks, including second, third, fourth and yard and siding tracks, had grown from 240,129.12 miles to 317,083.19 miles, an increase of 32.8 per cent. In the process the capitalization of the railroads had increased from $10,566,865,871 to $14,570,421,478, or 26.2 per cent. But the tonnage of the railroads within the same ten years had climbed from 95,328,360,278 ton miles to 215,877,551,241 ton miles, an increase of over 125 per cent.!

Then the railroads confronted a crisis. Unable to handle the traffic that multiplied three or four times as fast as their facilities grew, they turned to further plans for enlarging their capacity, only to find that, in the height of their prosperity and in the stress of the greatest demands upon them, their securities could no longer be sold and money for their improvements was not available. Then, instead of moving with greater speed to provide the tracks and terminals and cars and engines for lack of which less than a year ago grain lay rotting in the fields and communities suffered for want of coal, they slackened perforce their already too slow pace. And to-day, condemned by public opinion, by reports of commissions and by their own consciousness as inadequate to their task, causing daily loss to commerce by the insufficiency of their facilities and equipment, the railroads are impotent to relieve the situation.

This is a national calamity. Its force is felt not only in the falling prices of the stock exchange, but in the falling tide of commercial activity, in the lowered price of the commercial metals and in the slackened demand for human labor. There is not a man, from President to the least of the laborers in this great industrial organization that we call the nation, who is not directly and personally interested in discovering the causes for the inability of the railroads to raise funds for their needs, and in doing his utmost to remove them. This is the railroad problem; this is the national problem.

Three theories are commonly advanced in explanation of the unsalability of our railroad securities. One is that a world-wide money stringency, due to great and general commercial activity, restricts investment in all kinds of securities. I am not a banker and should not presume to have an opinion upon this proposition, but it does not strongly impress me in the face of the fact that three-fourths of the fabulous five billions of dollars that Mr. Hill would have the railroads spend in the next five years in furnishing additional facilities, to-day stands to the credit of depositors in our savings banks alone. I believe the money exists and could be had if our railroad securities appealed to the confidence of our investors.

I count as first among the causes that have made their securities unsalable—the misdeeds of the railroads themselves.

I do not include in this term, for the purpose of this discussion, the payment of rebates. I would not deny under present conditions the perniciousness of the practice, or decry the efforts of government to terminate it. On the contrary, I hold it as much to the interest of the railroads themselves as of the country at large, that violations of the Elkins Act should be made impossible. And I know of no surer way to accomplish that end than for a righteous and determined executive to keep both carrier and shipper for the future in terror of the confiscatory fines which that drastic act imposes for its violation. I see no end to be gained, however, beyond unnecessary further irritation of an already inflamed public feeling, by wholesale and spectacular punishments of past offenses.

I protest further against imputing to the railroads alone the responsibility for these violations of our statutory law. Note my emphasis of this term, *statutory* law. When railroads first became the common carriers of the land, neither law nor custom denounced the giving of a rebate. The only limitation upon a carrier's discretion in the fixing of his rates was that they should not be unreasonable. Subject only to this limitation he could charge as he willed, demanding less from one and more from another and carrying free for whom he pleased. This theory and tradition passed into the railroad business at its inception. It was accentuated by the policy of the states in permitting the free incorporation of railroad companies and encouraging the multiplication of competing lines. The only effective weapon of competition the railroads had was their rates. In passenger traffic, it is true, competition of service counted for something, but it meant nothing in the movement of a car of grain or of hogs that the roadbed was smoother and the scenery more inspiring by one route than by another. It was the rate that moved the traffic. And as it was important both to the shipper who sold his tonnage and to the carrier that bought it, that the transaction should not be known to the competitor of either, the secret rebate came into vogue.

In the beginning this method of competition was not deemed

hurtful, and it was far from being stamped as immoral. The business of the country was more individual and less aggregate than to-day, and the task of getting the best rate that was going was as necessary and legitimate an element of business as were the problems of buying in the cheapest market and keeping down the cost of production. When rebates were general—and time was when no shipper was so poor as not to be able to get them—their only effect was to reduce by so much the general level of rates of the carriers. The railroads were the victims—the commerce of the country the beneficiary, of the practice; for the level of the secret rates tended, eventually and inevitably, to become the level of the open rates.

The railroads anticipated the law in an effort to put an end to the growing practice of rebating. But their pools—formed, it is true, in the hope of conserving their revenues, but well designed to accomplish the laudable end of maintaining stable rates—were denounced as unlawful in the Act to Regulate Commerce, passed in 1887, which also for the first time prohibited discrimination in rates on interstate shipments. Thus the carriers were commanded to resume the policy of open competition which their pools had restricted, and at the same time forbidden to use the only effective instrument of competition at their command—namely, manipulation of their rates. But as this latter prohibition carried no penalties for the shipper who should receive a rebate, and as proof of an offense by the carrier was difficult, the shippers' clamors for secret rates and the carriers' fears for the loss of their tonnage to their competitors overcame the dread of conviction, and the law was regularly and notoriously violated. The Elkins Act in 1903 for the first time made the receiver of a rebate equally liable to punishment with the giver, and made easy the task of proving the offense.

I may justly assume from the name of your association that you fairly represent the great body of shippers of the country. Let us be frank with each other. You know that a rebate was never given that was not also received. You know that the purpose of the railroads in paying rebates has not always, or often, been to enable a great trust to crush its competitors. You know that if the Elkins Act bore date a few years earlier than it does, and if no beneficent statute of limitations could be invoked to your aid, your accumulated fortunes could be wiped out by universal enforcement of that law. You know that whatever of obloquy in the public mind, or of condemnation in the courts, should rightfully be visited upon the participants in the past practice of rebating, should be shared by the shipping class as well as by the carriers.

I will go a step farther. There has never been any difference in morals, and since the passage of the Hepburn Act there is no difference in law, between the giving of a rebate and the giving of free or reduced passenger transportation. In these days when the mask of pretence is being universally lifted, it should not give offense to call the roll of those who have participated with the railroads in this discrimination. Statesmen who regulate the railroads, judges who fine them, preachers who condemn them, and the press that spreads among the people, with no too careful pen, the stories of their misdoings, all decorate the list. The railroads in this respect are in the position before the people of the woman taken in adultery and brought by the scribes and Pharisees before Christ for condemnation. And there is need again for the voice of a Master to say: "He that is without sin among you, let him first cast a stone."

Nor do I include among the misdeeds of the railroads that are responsible for the condition we are now discussing, their past activity in political affairs. I trust that the government of the American people, no matter what form it may assume, will never be so arbitrary that a great property interest, subject to governmental regulation, shall not be privileged to be heard in argument and in protest before the legislative body that determines the nature and extent of that regulation. If, in the past, other and more improper methods have been employed to influence legislative action, I subordinate my zeal to that of no man in demanding that such offenses shall both be punished and made impossible of repetition. Again I protest, however, against fastening upon the railroads alone the shame of these offenses, in the commission of which there must have been at least two offenders. Much of what has been alleged against the corporations in this respect has been but the natural response of the victim to the highwayman. I mention this not in extenuation of the act of the victim, who in the interest of public morals should have lost his life before parting with his money, but to remind a condemnatory people that there *was* a highwayman, and that he was *their* representative. And I think it no more than a square deal that part of the responsibility for this unspeakable shame should willingly be borne by a people that has been so careless of its liberties as to be supinely content to be thus represented in its legislatures.

The misdeeds of the railroads to which, in my judgment, is chargeable the hesitancy of the investing public to take their securities, are acts that more directly affect the securities themselves. There is a prevailing public belief, based on facts publicly shown, that railroad corporations have issued corporate obligations and applied the proceeds to purposes other than for which such obligations may lawfully be issued. Directors are understood to have purchased the securities of corporations, of which they are trustees, and to have sold property of their own to the corporations, making personal profit through their dealings with the trust estate. These and like operations violate certain world-accepted principles of prudence and of honor, and for that reason are condemned by the common mind. The fact that they are understood to have occurred in certain of our corporations suggests the natural inference that they are characteristic of all our corporate managements, and investors are suspicious of the securities of corporations conducted so at variance with the principles of business, of law and of morals.

There can be but one remedy for such a situation, and it should not await governmental action. If the corporations cannot or will not themselves find a way to repudiate these abuses, and to make impossible their repetition, we are in a poor way indeed to regain the confidence which their perpetration has disturbed. I speak impersonally. I describe a condition which I believe is generally realized and which seriously affects the public estimate of our corporation securities.

I place second in the list of causes of the want of confidence in railroad securities the uncertainty as to the kind and extent of governmental supervision and regulation to which the railroads are yet to be subjected.

The regulation that threatens peril to the railroads and the commerce of the country to-day is the regulation of the states. It is in the nature of things that such regulations can be neither logical nor consistent nor comprehensive. The local needs, the local prejudices and the local grievances all find reflection perforce in these local laws. It is the good of the state, not the good of the nation, that they seek to accomplish. Nebraska, Minnesota and Iowa, with population averaging 200 persons per mile of railroad, prescribe the same maximum passenger fare as does Pennsylvania, whose density of population is three times as great. And it is insisted that this rate of fare, already declared confiscatory in Pennsylvania, shall be adjudged compensatory in the states of one-third the population. The great grain-producing states reduce below the point of profit the rates on this tonnage that so vitally affects them, leaving to the carriers to make up, if they can, the reasonable return to which they are theoretically entitled, out of traffic in which the regulating states are not so directly interested. Local situations or influence dictate varying regulations of the hours of work, the rates of pay and other conditions of the employment of labor. Local wisdom decides what kind of headlights locomotives shall carry, what kind of safety signals and appliances shall be employed, and how the accounts of the carriers shall be kept. These conflicting regulations incalculably confuse the conduct of business, while they measurably decrease gross revenues, increase the expenses of operation, diminish the net returns, impair credit and limit the capacity of the carriers to make adequate provision for the growing traffic.

It will benefit us but little to debate the causes that produced the curious wave of animosity toward corporate interests that last winter carried this movement of restrictive legislation to high-water mark. Let us neither abuse the high source from which much of the suggestion proceeded, nor blame too harshly the men who sat in legislative seats and recorded the clamor that filled their ears. Let us rather, as students of our past history and builders of our future prosperity, take note of the fact, measure its significance and prepare to deal with it. There must be some way to bring home to the intelligence of the American people a realization of the truth that no man who has property to conserve or labor to sell can profit in the end by unjust or unwise treatment of our great instruments of transportation. And I cannot help but feel that it would tend greatly to wisdom and justice, and even to moderation in the treatment of this subject, if the people realized that the railroads would willingly submit to a plan of regulation that was wise and just. This point being gained, I believe it would be possible to convince the people that a wise and just regulation of the subject is only possible under a single and centralized authority.

The day is passed for unyielding opposition to all policies of federal control of our carrier corporations. Nay, more, the day has dawned in which to welcome that control. The railroad manager reads without heeding the lessons of the past, if he fails to acknowledge both the right and the power of the federal government to exercise that control; he comprehends but little the spirit of the times if he does not realize the fixed determination of the people to effect that control, and he looks but darkly into the future if he cannot see benefits to flow from it.

We must assume that the President, in preaching regulation of the railroads, has in mind practical regulation, designed to benefit in broadest sense the commerce that constitutes at once the wealth and the greatness of our nation, and through which alone our ninety millions of people live and prosper. It is not to be presumed that his is to be a crusade for mere abstract righteousness, in which business must be forced to the wall if perfection of spirit cannot be attained. Surely we are not to be led by a St. Louis, willing that his country should suffer financial ruin in order that the custody of the Crown of Thorns may be wrested from infidel hands. Nor by a

Marat, eager to prove the equal rights of man by the arbitrary use of the guillotine. And while the President may talk in general terms of more or less terrifying sound to the tumultuous and applauding crowds he meets on his journeys, we have a right to expect that precision and wisdom and conservatism will formulate his final recommendations to Congress. And, if that expectation is realized, the railroads of the country should co-operate with Congress and the Executive in an effort to terminate harmful agitation by securing speedily a plan of federal regulation that shall be sane and effective and final. If, on the other hand, we are cheated of this hope, I believe the country should, and will, turn to a leadership that promises treatment of these vital problems along sound and conservative lines.

There should be great care in experimenting with regulation that offers as warrant of its effectiveness the arguments of theorists rather than the practical proof of experience. Among the proposals thus to be tested is the one for federal limitation of the capitalization of interstate corporations. If the purpose and effect of such action is to invalidate in the courts or to depreciate in the exchanges what are now denounced as watered securities, the blow will fall not on the persons responsible for their creation, but on the victims who parted with money to acquire them. Such an act of vicarious punishment could only be justified by the unquestioned conviction that the continued existence of the assailed securities is a menace to the public welfare. The only ground for such belief is the unfounded fallacy that the amount of securities outstanding against a railroad property determines the rates it charges for transportation. The sufficient answer to this is the fact that the Union Pacific Railroad, with capitalization of $92,000 per mile of road, competes very comfortably, and upon equal rates, with the Atchison, capitalized at $50,298 per mile, and with the Great Northern, whose capitalization is $42,350 per mile. And the same rates between the same points serve for the Illinois Central, whose capital is $56,495 per mile, the Eastern Illinois, with $62,599, and the Alton, with nearly $115,000 per mile.

If the purpose of the proposed new federal power is to limit the future issue of securities by railroad corporations, the people, as is too often the case with hasty legislation designed to benefit them, are likely to be the losers. The issuance of stock beyond the face amount of the actual investment in railroad building has always represented the hope and faith of the builder in the success of his project, and has been the lure that has drawn him into the always uncertain and often desperate undertaking. If the promise of that possible profit be taken away, the independent railroad builder will abandon the field, and railroad extensions into territory now unserved will await the initiative of existing lines. The Hill lines and the Harriman lines each encircle vast empires now without railroad facilities, and other systems are not without their own private pastures. It would admirably serve the interests of these great systems if government limitations of the creation of capitalization should make it impossible for the railroad builder to invade these promising preserves, and thus leave their development to the convenience and selfishness of existing lines.

If, however, the scope of the suggested federal control of corporate capitalization be to insure publicity of their affairs, every honest corporate management should speed its early enactment.

There should be no objection to such federal supervision of the railroads as the national government now exercises over the national banks. It would be a source of strength and of improved credit to the railroads to have it known that the government inspected their accounts and made sure of the existence and value of their assets. It might make impossible, too, such misuse of the funds and credit of the corporations as recent revelations have disclosed. I do not understand, however, that the national government concerns itself with the rates of toll that the banks charge their customers. It may not be so in Chicago, but in New York, I am told, there is no subject on which the ingenuity of lawyers is more regularly taxed than in devising means to evade the usury laws. It seems that the government itself is not quite sure of these carefully regulated institutions, for while it holds them out to the people as a safe place in which to deposit their money without security, the government requires good collateral against its own deposits in the banks. Nor am I informed that, as a result of long-continued supervision by federal authority, there is greater righteousness among the banks and bankers than pervades the railroad business. We read from time to time of bank defalcations and embezzlements. Over $5,000,000 of the people's money was so stolen in the first six months of the calendar year. And the wasting of the assets of the bank and the money of its depositors in private speculation by its officers is not unknown to the history of banking. It is true that these crimes are quite generally punished, and it may well be that the fact that there are more bank presidents than railroad presidents in jail may not have the same significance that it now seems to have, after the railroads shall have been for so long a time under similar governmental control. But we should not delude ourselves with the belief that righteousness will altogether prevail in the railroad world when its operations come under such supervision as the national banks enjoy.

I rode not long ago down the river Rhine. I was not particularly impressed with the beauty of its scenery. The Hudson surpasses it in that respect. I saw with interest its storied castles, but the glamour of romance no longer glorified them, and they held my interest only while they could be seen. The fact that did impress me concerning the Rhine was the amazing use that was made of it as a highway of commerce. I trust that the still more wonderful possibilities in that direction of the Mississippi may not longer be neglected by our people.

But the castles of the Rhine took on new interest for me as the vast tonnage floating on the bosom of the stream reminded me that in those strongholds had dwelt the great traffic regulators of the Middle Ages. And the reflection came to me that it was not only by reason of the moderation of their regulations, but also because they protected the traffic from molestation or assault by other powers that they kept the golden stream of commerce flowing past their doors.

I mean to imply by this that the power that regulates should also protect. And I favor an open acceptance of federal regulation because it is only through adequate and effective assertion of the federal power that governmental control can be made uniform or just and the commerce of the country saved from the conflicting regulations of forty-six separate sovereignties.

It is now more than a year since the rate-making power was conferred upon the Interstate Commerce Commission. The wisdom that has moved the Commission to refrain as yet from exercising that power goes far to justify the placing of the power in its hands. Under this power the Commission has intimated that it would require that no through rate should exceed the sum of the locals. From this it results that the states now make the interstate rates. Let us suppose that the rate on grain from Oklahoma points to Galveston is 25 cents. The Texas Commission reduces its local rate to 7 cents; the Oklahoma Commission—soon to be born—does the same. The rate from Oklahoma points to Galveston thus becomes 14 cents instead of 25. If the Kansas Commission should fail to act, and if the railroads should maintain former rates to Galveston from Kansas points, the latter would be subjected to that undue disadvantage to localities that the Interstate Commerce Act prohibits under pain of heavy penalties. But the Kansas Commission would act, and the reduction in its local rate would effect a reduction of the through rates from Kansas to the Gulf. This, in turn, would reduce the rates on grain from the Missouri river to the Atlantic seaboard. And the Interstate Commerce Commission, though convinced of the reasonableness of the former through rate and desirous of preserving to the railroads the revenues accruing therefrom, would be practically powerless to restore it.

This illustration is not peculiar. It could be duplicated without limit and in any locality. The state of Arkansas fixes the passenger fare from St. Louis to the Gulf, over lines of travel that do not touch Arkansas soil, when it enacts that 2 cents shall be the maximum charge for the carriage of passengers from point to point within the state. Missouri prescribes rates of freight from the Mississippi river eastward to the Atlantic, and from the Missouri river westward to Utah, when she fixes the tolls for traffic passing wholly within her borders between the Missouri and the Mississippi rivers. Minnesota, in an act designed to be purely local, has legislated on interstate rates for the Dakotas, and has forced her railroads by state enactment unwillingly to violate the federal laws.

I need not press the argument farther. It is too plain for dispute that a state act prescribing rates of fare and of freight between points wholly within the borders of the state not only may, but in cases now before the courts actually does, so directly affect interstate commerce as to control and displace the rates prescribed under federal law. There can be but one outcome to such a conflict. It has been the law of the land since the famous case of Gibbons v. Ogden, that a state law directly affecting interstate commerce must give way to Congressional action on the same subject. If, in order to apply this principle to the existing situation, there be needed, in addition to the Act of Congress conferring upon the Commission the power to make interstate rates, further federal legislation declaring that the rate-making power thus conferred shall extend to the making of local rates that may control or affect the interstate rate, that is the kind of federal regulation that the next Congress should give us.

There is in this no invasion of state rights, no straining of the Constitution, no assertion of principles that have not long been familiar and often applied. The list of state laws that have been set aside as being in conflict with congressional action on the same subject is a long one. The right of the state to license and regulate navigation on the waters within its borders; to license importers to make sale of their importations; to authorize the damming or bridging of navigable streams; to regulate pilots in its ports—all were powers long exercised by the states, but perpetually denied to them when Congress finally assumed to regulate the subjects. There need, therefore, be no hysteria about the destruction of the rights of sovereign states when the growing needs of our national commerce force this further step forward under the Constitution.

Exhibits at the Railway Signal Association Convention.

The exhibits were shown in a large room on the fourth floor of the Public Service building, in which the convention was held, under the auspices of the Signal Appliance Association. More space was occupied than at any previous convention.

Adams & Westlake Co., Chicago, New York and Philadelphia.—Semaphore and switch lamps; new flat flame long time burner; tower lamp with shade reflector.

American Railway Signal Co., Cleveland.—Automatic signal operating one or two blades in two or three positions; one two-arm mechanism; two motor dwarf signals, one designed specially as a starting signal for side tracks; electric switch lock; switch indicator; switch boxes; track relays, two, three and five point.

American Vulcanized Fibre Co., Wilmington, Del.—Vulcanized fibre for track insulation.

Battery Supplies Co., Inc., Newark, N. J.—"Bsco" primary battery; Gladstone-Lalande battery. The exhibit booth was in the shape of a mammoth battery cell.

Bossert Mfg. Co., Utica, N. Y.—Signal plate clasp, one and two bolts; insulated rail joints, adjustable switch bracket.

Bryant Zinc Company, Chicago and New York.—Gould storage batteries; Waterbury primary batteries; Mock insulated joints; American instruments, D. D.; ammeters and voltmeters; portable and switch board line.

Continental Signal Co., Chicago.—A new electric-motor semaphore mechanism shown in operation; can be used at top or bottom of post, for two or three positions, and for upper or lower quadrant movement; a switch-box; a four-lever mechanical interlocking machine of new design.

Dressel Railway Lamp Works, New York.—Semaphore and switch lamps; special lamp, oil and electric, for use in the Washington (D. C.) railroad tunnel.

Duplex Metals Co., New York.—Copper clad signal wire with both weather proof and rubber insulations; spring seats for mechanical purposes.

Electric Storage Battery Co., Philadelphia.—Signal batteries and plates; the "chloride" and the "exide" plates; Missouri Pacific and Harriman lines standard cells.

Fairbanks, Morse & Co., Chicago.—Four h.p. special electric engine with direct-connected generator for electric lighting and battery charging; gasolene-motor velocipede car; gasolene four-wheel car.

Federal Railway Signal Co., New York, Albany and Chicago.—All-electric interlocking machine; switch mechanism; high semaphore signal; motor dwarf signal; switch box; indicator, electrical hand release.

Galena Signal Oil Co., Franklin, Pa.—Perfection signal and railway safety oil.

General Electric Co., Schenectady.—Three-position top mast motor signal of B. & O. standard; similar signal of new B. & O. type with Patenall-Loree upper quadrant spectacle; two-arm home and distant top mast motor signal with independent mechanisms; upper quadrant two or three-position topmast motor signal. All of these were in operation. Mercury-arc rectifier for charging storage batteries from alternating current circuits; signal relays.

General Railway Signal Co., Rochester, N. Y.—A large display of photographs of apparatus used in automatic electric block signaling and all-electric interlocking on the New York Central electric zone; similar displays showing apparatus for interurban service, and for the two Hudson River tunnels; views of automatic semaphores as installed on the Great Northern (upward inclination).

General Storage Battery Co., New York.—Different types of Bijur batteries used in signal work.

Gordon Battery Co., New York.—Gordon cells and supplies.

Gould Storage Battery Co., New York and Chicago.—240 A.H., 120 A.H., 40 A.H. batteries; various sizes of couple types; a new type of portable battery for signal service.

Handlan-Buck Mfg. Co., St. Louis.—Non-sweating switch and semaphore lamps; engine and tail lamps; metallic flags; new electric station lamp; long-time burner with flame ⅞ in. wide.

Hall Signal Co., New York and Chicago.—Style E electro-gas signal mechanism; style F electric motor mechanism; various types of relays and lightning arresters.

Hayes Track Appliance Co., Geneva, N. Y.—Hayes derail model A, size 5, with operating stand.

McClintock Mfg. Co., St. Paul.—Mercury-contact polarized relay; mercury contact interlocking relay; lightning arresters.

Northwestern Mfg. Co., Milwaukee.—Standard Browning motors, six sizes; motor generator set furnishing twelve volt circuit for operating the American Railway Signal Co.'s exhibit.

Quincy, Manchester, Sargent Co., Chicago and New York.—Q. & C. American insulated joint of the style in service on the Chicago & Alton for three years; also a new type of Q. & C. insulated joint.

Rail Joint Co., New York and Chicago.—Weber and continuous insulated rail joints; insulating fibre.

Railroad Supply Co., Chicago.—Four styles highway crossing signals; electric lock for outlying switches; the Railroad Supply Co. derailer; track relays; channel pins.

Railway Specialty & Supply Co., Chicago.—Arc lamp lightning arrester; pin and block wire joint; "1908" channel pin; test connectors; P. & M. rail anchor; Smith improved nut.

Stevenson, Arthur E., Buffalo.—A new design of electric mechanism for throwing either switches or signals.

Union Switch & Signal Co., Swissvale, Pa.—Combination outside motion plate detector bar; a new inside, motion-plate, detector bar; two-arm three-position electro-pneumatic signal movement; circuit controller operated by semaphore shaft operated circuit controller; battery charging switches; variable resistance coils; combination relay and indicator.

Westinghouse Machine Co., Pittsburg.—Westinghouse storage battery for block and interlocking signals.

Whall & Co., Boston.—Fibre for insulated rail joints.

A Method of Uniform Signaling.*

In accordance with the instructions of the Executive Committee and the action of the association at the last annual meeting, when the report then presented was referred back for further consideration, the committee submits the following report:

Introduction.—The committee has considered the Standard Code of the American Railway Association in all its discussions and conclusions and has departed from it only when the requirements of a consistent system apparently warranted changes. The intent of the committee is to recommend, not revolution in present practice in signaling, but rather evolution to meet changes that are demanded, and it has been guided in its deliberations by the principle that the object of the work of each and every department is the safe, expeditious and economical movement of traffic.

Basis of System.—A system of fixed signal indications may be based upon either of two assumptions:

1. That signals should indicate to the engineman what is required of him in the control of his train and also the reason for the required action.

2. That the engineman needs to know only what is required of him in the control of his train.

Since the purpose of signals is to give to the engineman of moving trains information or instructions that must be acted upon without hesitation, it is plain that the indications of the signals and the means of giving them must be such that the meaning can be grasped instantly, without conscious study or effort. It is taken to be self-evident that, as the number of different instructions conveyed by the signal aspects increases, it becomes increasingly difficult for the engineman to remember the meanings of the aspects used, especially any that are not often met with in his daily routine, and the chance of wrong reading increases. In addition, the practical difficulties in the way of displaying a large number of distinct aspects must be taken into account. Tested by these considerations, the first assumption, followed to its conclusion, is found to require too many aspects.

While it is assumed that the engineman must be fully acquainted with the unchanging physical characteristics and the running rules of the road, or portion of the road over which he runs, including locations of fixed signals, it is realized that the engineman's mind should be relieved, as far as possible, from the necessity of remembering what each signal is for; and plainly this can be done only by giving more indications than would be required in a system based strictly upon the second assumption.

*Report of Special Committee on Interlocking and Block Signals before the Railway Signal Association at Milwaukee, Oct. 9.

		REQUISITE INDICATIONS	APPLICATION
STOP		1 Stop here until authorized to proceed	a Interlocking signals b Manual block signals
		2 Stop here and then proceed	c Automatic block signals
		3 Stop here and investigate	d Stop signs
		4 Stop within certain limits	e Home switch signals f Train order signals
PROCEED	Clear	5 Proceed on unlimited speed route; next signal at proceed	a Interlocking signals
		6 Proceed on limited " " " " " "	a Interlocking signals
		7 Proceed	a Interlocking signals b Manual block signals
		.....	c Automatic block signals
		8 Continue	e Switch signals
		.....	g Track tank signs
		9 Restriction removed	h Signs (removing slow sign restrictions)
	Caution Approaching	10 Proceed prepared to stop at indicated point ahead	m Distant signals for Nos. 1, 2, 3
		11 Proceed on unlimited speed route next signal is at stop	a Interlocking signals
		12 " " limited " " " " " " "	a Interlocking signals
		13 Proceed prepared to pass next signal at limited speed	n Distant signals for No. 6
	Caution Here	14 Reduce speed	o Slow signs
		15 Proceed on low speed route next signal at proceed	a Interlocking signals
		16 " at low speed	a Interlocking signals
		SUPPLEMENTARY INDICATIONS	APPLICATION
		"A" Take siding here	b Manual Block signals
		"B" Take siding at next station	b " " "
		"C" Proceed block is occupied	b " " "

NOTE: Manual Block includes Telegraph Block, Staff Block, Controlled Manual Block.
NOTE: Indication No. 8—This indication may also be given at Interlocking Signals which are not Block Signals where Permissive Blocking is used, at Block Signals (Block Station Closed), at Train-order Signals (No orders) and at Flag Station Signals (No Passengers).
NOTE: Indication No. 14—This indication may also be given at a signal to show that "19" orders are to be received.

Exhibit No. 1—Outline of Indications for Method of Uniform Signaling.

It is, therefore, the conclusion of the committee that, in a system of signal indications, the aspects should primarily serve to indicate what is required of the engineman in the control of his train, and secondarily should provide for the giving of certain additional useful information, limited by the reasonable practicability of displaying the necessary aspects and the added burden upon the engineman's memory that will result from the use of many aspects.

Indications and Requisites.—Taking this view, the committee has developed the indications deemed requisite, with their applications as shown by Exhibit No. 1, from which it has deduced the necessary requisites of installation and adjuncts (which follow), illustrated by certain typical aspects shown in Exhibit No. 2.

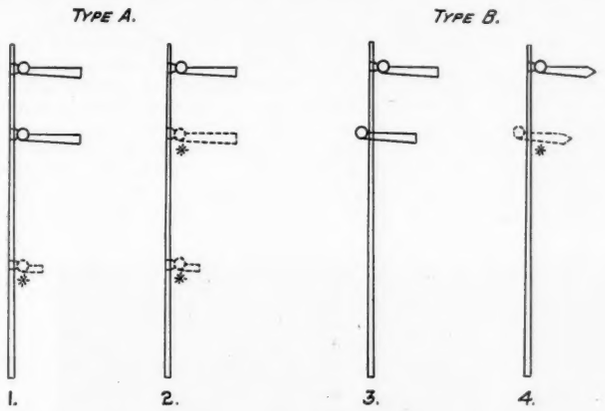


Exhibit No. 2—Typical Aspects for Method of Uniform Signaling.

NOTE.—Type A.—"Stop here until authorized to proceed." Type B.—"Stop here and then proceed." The aspects here shown are recommended for display of STOP indications Nos. 1 and 2 of Exhibit No. 1, and are typical representations of interlocking and block signals. Arms shown in dotted lines and marked with an asterisk are to be used only when necessary.

REQUISITES OF INSTALLATION.

The numbers in the columns at the left indicate the corresponding Requisites in the Standard Code. Departures from the wording of the Requisites in the Standard Code are indicated by *—new Requisites by X.

Signals affected.				
Interlocking	Manual Block	Auto. Block	Other	
1 *	1 *			Signals of prescribed form, the indications given by not more than three positions and either by three arms, the upper two of which, when horizontal, shall have their ends in a vertical line, or by arm or arms of distinctive form; and, in addition, at night by lights of prescribed color in a vertical line.
		1 *		Signals of prescribed form, the indications given by not more than three positions and either by wo arms which, when horizontal, shall have their ends in a diagonal line, or by arm or arms of distinctive form; and, in addition, at night by lights of prescribed color in a diagonal line.
			x	Signals of prescribed form, the indications given by not more than three positions and by arm or target of distinctive form; and, in addition, at night by lights of prescribed color which, when there are two, shall be in a horizontal line.
x	x	x	x	A distinctive position of the arm for the caution (or approach) indication.
2 *	2 *	2 *	x	The apparatus so constructed, that the failure of any part directly controlling a signal will cause it to give its least favorable indication.
3 *			x	Signals, if practicable, either over or upon the right of and adjoining the track to which they refer.
	3 *	3 *		Signals, if practicable, either over or upon the right of and adjoining the track upon which trains are governed by them.
4	4	4	x	Semaphore arms that govern, displayed to the right of the signal mast* as seen from an approaching train.
5	5			The normal indication of Home Signals—Stop.
		5		Switches in the main track so connected with the block signals that the Home Block Signal in the direction of approaching trains will indicate Stop when the switch is not set for the main track.

Signals affected.				
Interlocking	Manual Block	Auto. Block	Other	
6 *				The interlocking of signals with switches, locks, railroad crossings or draw bridges so that a clear or caution indication at a Home Signal cannot be given unless the route to be used is clear and stop signals displayed for all conflicting routes.
	6 *			The apparatus so constructed that the failure of the block signal instruments or electric circuits will prevent the display of the clear or caution indication at the Home Block Signal.
		6		Signal connections and operating mechanism so arranged that a Home Block Signal will indicate Stop after the ..... of a train shall have passed it.
7				The interlocking of switches, locks, railroad crossings, draw bridges and signals through levers, or their equivalent.
	7			The relative position of the home signal, and track instrument or releasing circuit, such as to make it necessary that the rear of a train shall have passed.....feet beyond the Home Block Signal before the signal at the preceding block station can be released.
8				Interlocked levers, or their equivalent, by which switches, locks and signals are operated.
9 *				The apparatus so constructed that the failure of any part directly controlling a switch or lock will prevent the display of a clear or caution indication at the Home Signal.
10				Facing point locks, for all facing point switches in main routes.
11				Detector bars, or their equivalent for all facing point switches in main routes.
12				Pipe, or its equivalent, compensated for changes in temperature, for connecting levers, in mechanical interlocking, with switches and locks.
13				Latch locking, or its equivalent.
14				The established order of interlocking such that: A clear or caution indication at a Home Signal cannot be displayed until derails or diverging switches, if any, in conflicting routes are in their normal position, and the switches for the required route are set and locked. The display of a clear or caution indication at the Home Signal shall lock all switches and locks in the route as far as the point to which such signal gives permission to proceed, locking all opposing or conflicting signals and releasing the corresponding Distant Signal, where such signal is used. Where Distant Signals are used, the display of a clear Distant Signal shall effect the same locking as that accomplished by the display of a clear or caution indication at the Home Signal.
15				Interlocking and Block Signals interconnected, where both are operated from the same station.
x				Interlocking signals so arranged that the permissible speeds, in not more than three gradations—unlimited, limited and low speed, shall be indicated.
x				Short arms and short range lights for all low speed indications and dwarf signals.
x	x	x		Adequate approach indications for all high speed signals.
x	x	x		Aspects used for conveying information or specific instructions, combined with the aspect of interlocking or block signals when it is necessary to give information or instruction indications at such signals.

Explanation of Action.—While two lights in horizontal line are recommended for the night aspect of signals which, when in stop position, give indication No. 3, it is the sense of the committee that, in connection with a switch target, one light is sufficient.

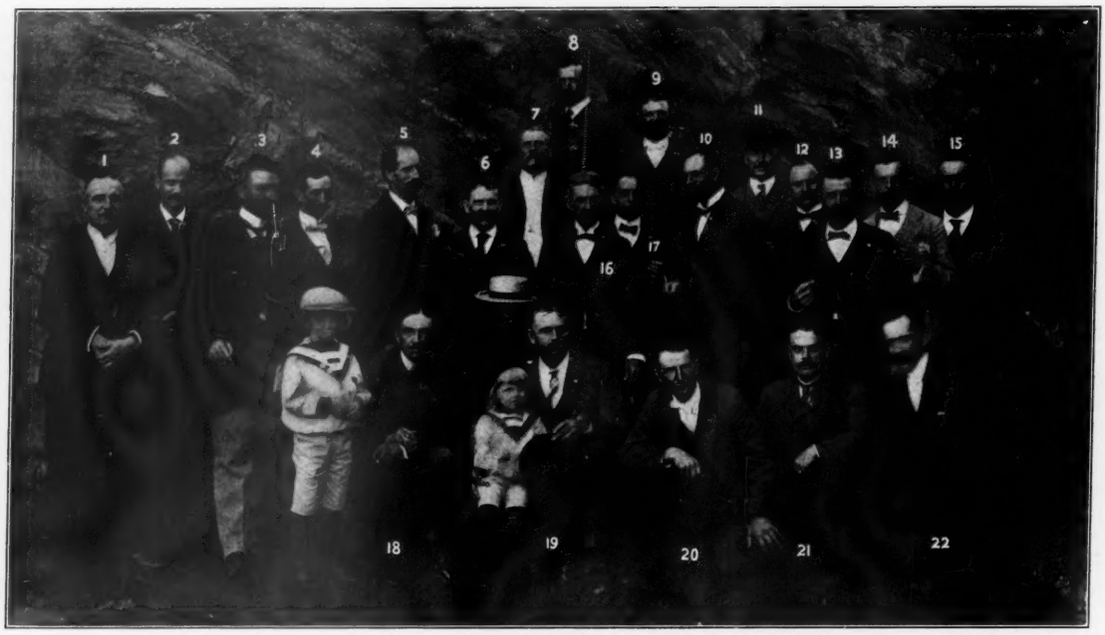
The committee, by vote of six to five, included in the outline, Exhibit No. 1, the indication, "Stop within certain limits," because

it conforms to present practice on a great many railroads in respect to Train-order Signals, although such practice is not sanctioned by the Standard Code. On all other points covered by the report the action of the committee was unanimous.*

Recommendation.—The committee concludes that, by accepting certain basic principles as outlined, it has established the number of essential and practicable indications; and it recommends that the indications and requisites submitted be approved and transmitted to the American Railway Association.

Railway Signal Association History.

Recent attempts to write the history of the Railway Signal Association, which was started in 1895, at Chicago, as the Railway Signaling Club, have not been entirely successful, the data required to answer some interesting questions having been lost. In consideration of this fact, and with a view to making the history of the association as complete as possible we give herewith a photograph, recently resurrected by Mr. Rudd, the newly elected president of the association, which was taken at Easton, Pa., about 1895 or 1896. While this picture is, in a sense, ancient history, it will be seen that those faces in the group which are still familiar at the meetings of the association, looked about the same then as now. It must be that these men are still young.



The Railway Signaling Club in Its Infancy.

1. C. H. Dressel
2. Geo. M. Basford
3. Charles Hansel
4. Frank Rhea
5. A. J. Wilson
6. G. H. Pfiel
7. Henry Johnson
8. W. H. Elliott
9. G. W. Hill
10. G. W. Blodgett
11. G. Hansel
12. W. W. Salmon
13. C. C. Rosenberg
14. J. W. Lattig
15. T. H. Patenall
16. W. S. Logue
17. W. A. D. Short
18. E. M. Seitz
19. W. W. Young
20. A. H. Rudd
21. W. J. Gillingham, Jr
22. E. D. Wileman

Notes from the North-Western Bulletin.

DISTRIBUTING CARS TO SHIPPERS.

No definite rule regarding the tabulation of car orders can be made to work to the best advantage at all stations. But there are some general rules. All orders for cars must be placed on Book Form No. 422 for the purpose of keeping record of car orders furnished. * * * To get on proper footing with your shippers, study their wants, keep track of what they will have to ship, and make them understand that there will be no favors shown. Some years ago one of the patrons at my station offered me my winter fuel at cost, which seemed quite a favor; possibly saved me seven or eight dollars, but as long as this man was in business he was constantly asking favors of me, and seeking preference over other shippers. I promised myself then that I would never sell myself to one of my patrons. Handle your business in such a way that you fear no one, and be just and fair with your patrons, and I think you will have no trouble. * * * Another thing. Sum up the situation each day. Interview your patrons as often as possible. Talk matters over with them. Explain to them the importance of expediting the unloading and reloading. Assist them by suggesting to them some of your ideas. Keep them on the good side of you, and the best of results are sure to follow. Notify them promptly on arrival of all loads, that they may get their men to work immediately as soon as car is placed. During the month of February we handled 86 cars, all loaded, and not an empty box car received during the month. We unloaded our cars and filled the orders for empties from them and kept things moving.—*W. H. Leak.*

*This indication (No. 4) was cut out by the Association.

FREIGHT HOUSE WORK.

We are closely following the new rules for loading merchandise which have been prepared to insure economical and safe loading and adherence to the rule of loading in station order. It has been found necessary to have the men memorize the loading list, otherwise there is loss of time. To prevent errors I have issued rules to have the loading numbers placed on shipping tickets by some one man; to have each check clerk make a mark on the shipping ticket when goods are received from wagons; to require each check clerk to call the loading number to his caller before the number is marked by the caller on the truck load; requiring the check clerk to see that the caller marks the right number on the truck load, right-side up for the trucker to read; and, under the loading number, the check clerk's initial must be marked. The caller must call off the number in a clear voice to the trucker. The trucker leaves his load on the platform opposite the proper car and picks up and takes the nearest empty truck to the nearest check clerk. The chief check clerk must examine each car before it is closed and make a note of the fact. In April we had occasion to dismiss 134 men and in May 112. With the warehouse force thus constantly changing errors are, of course, inevitable. The rush of business also interferes with accuracy. In one day recently we sent out 2,746 L. C. L. shipments.—*H. S. Jaynes*, Agent at Omaha.

FRANKNESS.

It is absolutely essential to give out no information that may have a tendency to mislead and confuse. It is far better to acknowledge our inability to answer a question where there is any doubt in our minds as to the ultimate outcome. Much harm is being done by endeavoring to answer questions on which we are not conversant. It leads to confusion, invites criticism, and sometimes forms the basis upon which damage claims are made.—*G. D. Brandt.*

Work is progressing with considerable rapidity on the Katanga Railroad, all but a few miles of which will be in Portuguese West Africa, extending westward from the Atlantic at Lobito Bay, near Benguela, about 800 miles to Katanga, in the southeastern part of the Congo State, around which are very valuable mines. The contract for the road has been taken by the English firm of Griffiths & Co. Fifty miles along the coast are in operation, and work is progressing on 200 more with a force of 8,000 men, 1,500 of whom are Hindoos brought from Natal.

Railway Signal Association.*

The eleventh annual convention of this association was held at Milwaukee, Wis., October 8, 9 and 10, between 300 and 400 members and guests being present. President J. A. Peabody (C. & N. W.) occupied the chair. The association was welcomed to Milwaukee by the Mayor of the city, who reminded his hearers that the place was renowned not for beer alone. The value of the beer made yearly is about 26 millions, but of iron products and machinery, Milwaukee produces over 87 millions a year.

President Peabody, in his address, spoke of the rapid growth of the association, the membership now being over 900, and reminded the members that this growth is of the right kind, the new acquisitions being largely active members who, under the amended constitution, are likely to be representative members. The amendment providing for representative membership was necessary in order to assure the proper financial support for important committee work. This committee work should result in standards which, when adopted, will effect marked savings to the members. The President referred to the inconvenience which results from having a meeting in September, only one month before the annual meeting, leaving an insufficient time for the preparation of the results of the September meeting for action in October. He congratulated the association on the recognition which is now accorded it by the American Railway Association, and called upon the members to do full justice to the opportunity thereby offered them to make real progress in the art of railroading.

The first business was the consideration of a number of amendments to the constitution, which were adopted unanimously. These provide, in substance, as follows: The membership shall henceforth consist of five classes—active, representative, junior, associate, and honorary. The term "active member" now means the same as was formerly meant by senior active member; and a representative member is a person eligible for active membership and having a practical knowledge of signaling, who is the duly appointed representative of a railway. An applicant for membership must remit the amount of the annual dues as an entrance fee, which will be in lieu of all dues for the year in which he is elected and which will be refunded in case he fails of election. Election is by two-thirds vote of the entire executive committee. No railroad or system under one general manager shall have more than one representative member. Each such member, in voting on the approval of standards or other important questions, shall have one additional vote for each 500 miles of road and one for each 500 working signal arms or disks. Representative members, in addition to personal dues, must pay each year an assessment, to be fixed by the executive committee, which, however, shall for each vote be not more than the amount of the annual dues. The officers of the association must be elected from the active members. Article 8, section 1. of the constitution is amended to read:

Any proposition looking to the approval or recommendation by the association, of definitions, nomenclature, specifications, standard construction or standard practice, or aimed at defining formally the position of the association on any matter of importance, shall be presented in writing and shall be accompanied by drawings if the latter are necessary for a clear understanding of the subject. No such proposition shall be acted upon by the association unless it has been published in the advance notice, provided for in the constitution, of an annual meeting and has been submitted to the association at such meeting for discussion. After discussion a vote of the active members shall be taken at the same meeting to decide whether the proposition shall be submitted for decision by letter ballot. If the vote is affirmative the secretary-treasurer, within three months from the time when the vote is taken, shall send by mail to each active member a blank ballot and a copy of the proposition with a report, approved by the executive committee, of the discussion thereon. The ballots are to be filled up, signed and remailed to the secretary-treasurer, who shall count all the ballots received within thirty days from the date on which they were sent to the members. He shall then announce the vote in such manner as the executive committee may prescribe. A proposition for which two-thirds of the votes cast are affirmative, provided that ballots properly filled up have been returned by not less than twenty active members, shall be adopted by the association.

All-Electric Interlocking.—After finishing with the constitution the meeting took up the report of committee No. 8, on standard specifications for electric interlocking. This report filled over 25 pages. The meeting spent the rest of the day discussing it in great detail, but only about half of it was gone over, and the next morning, Wednesday, the whole was referred back to the committee. This report was made by a committee of nine prominent members, of which Vice-President L. R. Clausen (C., M. & St. P.) was chairman. It had been prepared with great care and was commended by a number of members as a highly satisfactory code of specifications, but the committee was subjected by individual members to persistent questioning concerning every detail in which there was room for a difference of opinion, and, in consequence of this action, the association spent the whole day in inconclusive committee work. A number of changes in words or sentences were quickly agreed to by the meeting and accepted by the committee; but others, on which there was room for a variety of views, were left for the committee to deal with hereafter. For example, the clause requiring the railroad company to blast and remove rock preparatory to the installation of interlocking apparatus was quickly changed to read *solid* rock; and the clause providing that defective material will be returned upon *written* request of the contractor *at his expense* was quickly put into the form here shown, the italicized words having been left out of the original draft. But the clause providing for an endurance test for generators had to be referred back to the committee because, like many other clauses, it was a matter which could be settled in committee, but could not be settled in a large meeting. This was true of the provision concerning the lock-rod and plunger and their respective dimensions, and many other features.

Comprehensive Signaling Scheme.—On Wednesday substantially the whole of the day was taken up with a discussion of the report of the special committee on interlocking and block signals. This is the committee that prepared the "comprehensive signaling scheme" which was presented one year ago and was printed in the *Railroad Gazette* of October 26, 1906; and the present report was in the nature of a supplement to that one. The committee now consists of A. H. Rudd, chairman; L. R. Clausen, vice-chairman; Azel Ames, Jr., C. C. Anthony, H. S. Balliet, Charles A. Dunham, G. E. Ellis, M. H. Hovey, J. C. Mock, F. P. Patenall, J. A. Peabody, Frank Rhea, Thos. S. Stevens and H. H. Temple. With few exceptions these same men constitute the signaling committee of the Railway Engineering and Maintenance of Way Association, and, acting for both associations, an exhaustive discussion of the subject under consideration was recently held at Detroit, occupying 10 days and nearly as many nights.

The action of last year, with what had preceded it, was reported in the *Railroad Gazette* on pages 350 and 368 of the date above mentioned. The chief changes from present general practice were: to approve the upward inclination of the semaphore arm; the use of three-position signals, thus abolishing the distant signal; and the requirement of at least two lights on all high signals at night, those on automatic signals to be staggered instead of being placed vertically one above the other.

The principal feature of the report now presented is Exhibit No. 1, consisting of an outline of the indications requisite in a reasonably complete system of uniform signaling which shall provide for the present needs of American railroad practice (including some features which are unscientific and ought to be abolished), while, at the same time, adhering to a reasonable consistency, and to the principle of employing only the best method for each particular purpose. The report is given in full in another column.

After brief discussion the meeting approved the last paragraph under the head of "Basis of System," that beginning, "It is, therefore, the conclusion of the committee," etc. The different items of Exhibit No. 1 were then explained in detail by Mr. Rudd. Objection was made to the use of the word "requisite" in the heading, on the ground that this use of this word here, meaning things requisite in the scheme prepared by the committee, would be confused with the use of the same word in the standard codes of the American Railway Association, but a motion to strike out the word was lost. At the end of the discussion the items of Exhibit No. 1 were adopted as reported, with the exception of No. 4, which was ordered cut out. This action was based on the view that the common practice, with train-order signals, of permitting a train to stop with its front end at some point beyond the signal is not consistent with good signaling.

The requisites of installation, as arranged in the report, are put into a single code, those for interlocking and those for block signaling together; but it was voted that before sending the report to the American Railway Association these requisites shall be rearranged into five separate chapters, namely, interlocking, manual blocking, controlled manual blocking, automatic blocking, and miscellaneous.

The report was then approved and it will now go to a letter ballot, and, after approval by the association in that way, it will be laid before the proper committee of the American Railway Association.

THIRD DAY.

On Thursday morning the report first taken up was that of Committee No. 5—Specifications for Automatic Semaphore Block Signals, Operated by Direct Current, for Steam Railroads. Most of the time allotted to the meeting having been taken up, this report was not discussed and was accepted as a progress report. The Specifications for Mechanical Interlocking, Committee No. 15, received the same treatment.

The next business was the report of Committee No. 11, on Signal Lamps. This report, which will be given later, deals mainly with the method of fastening the lamp to the post and with sizes of lenses. It was accepted as a progress report, final acceptance being objected to on the ground that there is need of better fitting sockets and brackets. Experiments are going on

*List of exhibits on page 456.

to accomplish this improvement. The report of Committee No. 14, on How to Remedy the Effects of Foreign Current on Automatic Block Signals, was accepted and the committee discharged. The committee was congratulated on its twelfth conclusion. This report is printed in another column.

The report of Committee No. 2, on Maintenance of Automatic Block Signals, was briefly discussed. It deals mostly with conditions on roads of light traffic and is, therefore, silent on some features which are important on roads of heavy traffic; but the criticisms were few and comparatively unimportant. It was pointed out that zincs need not always be taken out as soon as recommended by the committee, it being practicable to use them in high-resistance circuits. Concerning the opening of sealed relays by maintainers, it was declared that the instructions should be the same to all the men, whether experienced or inexperienced, and none should open a relay except when necessary to put a signal in service. Another member called attention to the fact that in many cases it was desirable to use for track batteries four cells instead of two. The report was accepted.

The report of Committee No. 12, on Rubber-covered Wire and Cables, was vigorously discussed, but diversity of view was developed on important points, and the report was referred back to the committee. This committee presented specifications for cables for circuits carrying 600 volts or less, and recommended that the specifications adopted last year for solid conductors be changed in two features: (a) the required degree of insulation resistance, and (b) the time of immersion for the insulation resistance tests. For insulation resistance a new table was presented making less severe requirements, and it was recommended that the 48-hour term for the immersion test be made 12 hours. For the small sizes of wire a period of 12 hours is believed to be ample, and on the larger sizes the committee holds that the manufacturer will, for his own protection, immerse the wire a sufficient time. The reduction of time should reduce the cost of the wire to the consumer. There was a spirited discussion on a proposal to modify paragraph 2, of the specifications adopted last year, so as not to require that 70 per cent. of an insulating compound shall consist of mineral matter only. This proposal, with one for a similar loosening of paragraph 10, relating to acetone extract, was made with a view to admitting, under the specifications, an insulating compound the composition of which is kept secret; but the meeting finally voted unanimously to retain the present strict requirements, the prevailing view being, evidently, that a secret compound should be sold on its reputation, secrecy being radically inconsistent with the theory of detail specifications, which are designed to promote the most complete publicity.

In response to the criticism that the specifications would cause the rejection of the "copper-clad" steel wire recently described before the association, the title of last year's specifications was changed to read, "Specifications for rubber insulated *copper* signal wire."

The report of Committee No. 13, on the Maintenance of Manual Controlled Signals, was accepted for publication.

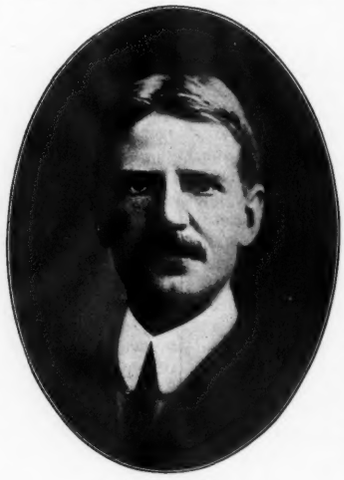
C. C. Anthony, for the Committee on Definitions, reported the action of the Executive Committee on the "Railway Signal Association Dictionary," which is to be published by the *Railroad Gazette*. This proposed work is to be similar in form and arrangement to the well-known "Master Car Builders' Dictionary" and the "Locomotive Dictionary," issued by the same publisher. The "Signal Dictionary" will be edited by Messrs. Adams and Hitt, Associate Editors of the *Railroad Gazette*. Mr. Adams is author of "The Block System" and Mr. Hitt is editor of the "Master Car Builders' Dictionary." Mr. Anthony briefly described the plan of the work. A committee of the association has been appointed to supervise it. This committee consists of Messrs. Anthony, J. C. Mock and Azel Ames, Jr. On motion of B. H. Mann (Missouri Pacific) it was voted unanimously to approve the scheme for the dictionary and the action of the Executive Committee thereon.

The Secretary's report showed a membership one year ago of 664, and on October 1, 1907, of 897; and it was informally stated that new members since admitted would bring up the total to 925. The Treasurer reported total receipts, including balance at the beginning of the year, of $6,703. The balance on hand October 1, 1907, was $1,718.

The meeting passed an enthusiastic vote of thanks to Vice-President Clausen for the very satisfactory arrangements which had been made for the Milwaukee meeting, and, after selecting Washington, D. C., as the place for the next annual meeting, and electing officers, adjourned. The election resulted in the choice of the following:

President, A. H. Rudd, Pennsylvania Railroad, Philadelphia; Vice-President, H. S. Balliet, Grand Central Station, New York City; Secretary-Treasurer, C. C. Rosenberg, Bethlehem, Pa.; Eastern Member of Executive Committee, F. P. Patenall (B. & O.); Western Member of Executive Committee, C. E. Denny (L. S. & M. S.). Vice-President Clausen holds over and the new Executive Committee will consist of Messrs. Rudd, Clausen, Balliet, Rosenberg, Patenall, Denny, Peabody, Morrison and Mock.

Alexander H. Rudd, the new President of the Association, is Signal Engineer of the Pennsylvania Railroad. He was born in 1867 and graduated from the Sheffield Scientific School of Yale University in 1886. He began railroad work that fall as a draftsman in the real estate department of the Pennsylvania. After a few months he was transferred to the signal department as a draftsman, and in 1892 went to the New York Central & Hudson River as signal inspector of the Hudson division. The next year he was appointed assistant superintendent of signals in charge of that division, and in 1894 went to the New York, New Haven & Hartford as foreman of electric signals and signal engineer of the Hartford division. In 1900 he was appointed signal engineer of the Delaware, Lackawanna & Western. In the spring of 1903 he resigned and returned to the Pennsylvania to take the position of assistant signal engineer, from which he was a few months ago promoted to the place he now holds.



A. H. Rudd.

On Wednesday evening about 300 of the members and guests, including 40 or more ladies, attended a banquet at the Hotel Pfister. The feature of the banquet, aside from the gowns of the women and the decorations of the room, was the address of Colonel H. G. Prout, Vice-President of the Union Switch & Signal Company, who spoke on the relations of the signal manufacturer to the consumer. Speaking of the true ethical basis of a bargain or contract, which, to be right, must be satisfactory and profitable to both sides, and declaring that this must be the cornerstone of the policy of any intelligent manufacturer who desires to establish an enduring business, Colonel Prout continued:

The signal manufacturer nowadays is compelled to assume toward his customers the attitude of the professional man toward his clients, and our customers may, without distortion of the sense of the word, be properly called our clients. The man who is building and selling engines or bridges, or machine tools or signaling and interlocking apparatus, is constantly called upon to take in trust the interests of his customer exactly as the lawyer or the doctor or the engineer takes in trust the interests of his patient or client. That is, we are constantly called upon for professional advice, either directly or indirectly, and very often it is quite directly. We are called upon to assist in scheming the interlocking of the signaling of a given proposition. We are called upon to recommend apparatus and methods. We are called upon to design special apparatus. It would seem that with the greater employment by railroads of higher class and competent engineers, the call upon signaling manufacturers for this professional service must be diminished, but it continues. It is of the utmost importance that the signal maker and the signal user work together, because of the intricate nature of their work. The important work of simplification of standards is still before us. The Union Switch & Signal Company manufactures and sells 156 different semaphore castings, 130 different pipe poles for signals, 95 different front rods, and 140 different lock rods. We carry on our lists and keep manufacturing and storeroom accounts with 37,500 different, separate articles, to say nothing of some unknown thousands that are not listed. With such a multitude of details there are constant chances for mistakes. Even if there were no mistakes, the clerical work and correspondence must be enormous, and a single mistake may lead to $25 worth of correspondence, though perhaps it has to do only with a dollar's worth of material. With more brains and more care the dealings between the maker and the railroad could be greatly smoothed. The saving that could be made if the railroads and manufacturers could get together and abolish about three-quarters of the present patterns, drawings and dies is in some degree indicated by the fact that at the beginning of last month the Union Switch & Signal Company had on hand $1,736,000 worth of material.

Colonel Prout complimented the members on their high ideals, especially as shown in their efforts to establish proper standards of construction and operation, and to secure the approval of the American Railway Association for such standards; but he slyly suggester that the last-named association had not always made lightning speed in its promotion of improved practice.

Electrification of the Rochester Division of the Erie Railroad.

BY W. N. SMITH,
Electric Traction Engineer, Westinghouse, Church, Kerr & Co.

(*Concluded.*)

A very simple type of pull-off was devised for curves in span construction, and it so happens that both the Rochester and Mt. Morris yards have considerable curvature. The pull-off consists simply of a spool type insulator, with a piece of pipe cemented through the center, this pipe being slipped over the hanger spacing rod joining the messenger and trolley clips, thus giving an insulating connection through which an ordinary pull-off cable can be attached to both messenger and trolley wherever required. The division of the horizontal pull between the messenger and trolley wires is easily adjusted to suit the conditions, by shifting the spool type insulator up and down the spacing rod, by inserting longer or shorter nipples of pipe underneath it. In general, when near a span wire, the messenger cable is supported rigidly on its insulator and the trolley wire needs all the side pull; but in the middle of a span the pull must be equally divided between messenger and trolley wire.

The presence of several through truss bridges over streams, and two low bridges over the Erie right of way, necessitated the employment of special construction at these points, particularly at the bridge at Clarissa street on the outskirts of Rochester. The original clearances here were so low that the roadbed had to be excavated out and the track lowered about 2 ft., the minimum clearance between the rails and the trolley wire being finally 18 ft. The messenger is fastened to a horizontal spool type insulator mounted at the center of a substantial piece of turned oak, which is long enough to carry two more similar insulators, one on either side of the center one.

The steel hangers reaching down from the overhead bridge structure carry the two side insulators, so there are always two insulators in series between the 11,000-volt messenger cable and the steel work of the bridge. These insulated supports are suspended at short intervals from the under side of the steel work of the bridge, and are further supplemented by the use of steady strains which prevent any side displacement of the trolley wire. The shortest sizes of hanger spacing rods are used in such places. Where the bridge trusses are high enough to permit it an iron stirrup is employed like that used in span work, which carries the standard form of straight line insulator, and the regular type of catenary suspension is employed.

At either side of these overhead obstructions it was necessary to provide warnings for brakemen upon the tops of freight cars as substitutes for the warnings of hanging pieces of rope previously used. In the accompanying photograph is given a view of the Clarissa street bridge, showing both the old arrangement of ropes and the new one for electrified tracks which supplanted it. It will be noted at this point only one of the two tracks is electrified and freight trains are here obliged by rule to use the unelectrified track; but to insure that the place shall be absolutely safeguarded, the electrified track is fitted with warning signs of the type shown. They consist of a horizontal suspended swinging wooden rod, mounted with its axis at an angle, so that it swings up as it is pushed to one side. The pantagraph trolley is fitted with a set of springs on each side, one of which strikes this warning sign a blow as it passes under and instantly throws it to one side. The blow is struck upon a heavy leather strap held taut by a coil spring of steel wire in tension, the whole contrivance being fastened to the lower half of the pantagraph trolley mechanism so that it is at the right height for striking the warning sign. The swinging rod is mounted upon the pole by means of insulators, effectually preventing any leakage to the ground, even though a car might stand still directly under the sign and make contact with it for an indefinite length of time.

Nearly all the telephone and telegraph wires which cross over the 11,000-volt trolley wire have been put underground, particularly in the case of the leads composed of only a few wires, but where the line is crossed by heavy telephone trunk lines they have been protected by the basket type of construction, so designed as to effectually prevent a broken telephone wire from falling across the messenger or trolley wire. This consists primarily of four galvanized steel cables stretched between opposite ends of two cross arms, one placed above and the other below the wires of the intersecting telephone line, and the four cables are joined by a basket work of light strap iron ribs placed at intervals of 3 ft. to 4 ft. across the whole span, forming the sides and the bottom of the cradle and effectually preventing a broken telephone wire from dropping any further. This construction was also followed in the case of an electric light wire at Avon.

The telegraph department of the railroad, in connection with the signal department, built a private telephone line of two copper wires between Rochester and Avon, with instruments at all signal towers and stations in the despatcher's office, and at the substations, and car shed, and master mechanic's office. This telephone system is run upon the trolley bracket poles, transposed every third pole, and has worked satisfactorily.

Lightning protection for high tension single-phase railway lines not having as yet been standardized, only a part of the line was equipped with line lightning arresters, which are of a swinging fuse gap type of construction, made by the Westinghouse Electric & Manufacturing Co. This type of lightning arrester consists of a gap one side of which is connected directly to the trolley through a No. 4 copper wire, and the other side being directly connected to the ground rod, through a fuse enclosed in a tube which, while the fuse is intact, is maintained in an inclined position like a pendulum held back from its position of rest; but when the fuse is blown a latch is released which allows the fuse tube to swing to a vertical position which shows conspicuously from the ground, and signifies to the patrolman that the fuse should be replaced. The fuse tube can then be lifted off the suspending lugs by a pair of insulating tongs made for the purpose, and the fuse renewed and replaced in a few moments.

On the other half of the line lightning arresters were not installed. During the summer two of the poles were struck by lightning, but the metal work of the brackets and truss rods being entirely grounded, these poles were not damaged below the topmost point of attachment of the truss rods, which is generally not over 18 in. from the top of the pole. In a number of instances the lightning arrester fuses have blown, but it is not known how many of them have blown simultaneously. Although the extent to which this type of arrester is fully protective is hardly established as yet, at no time since regular operation started has any injury to the car equipment resulted from lightning, though there were several severe storms during June and July.

The trolley line is divided into seven sections—one comprising the Rochester terminal, one the Avon yard, three sections in the main line between Rochester and Avon, and two sections south of Avon. The sections are divided by trolley section insulators made by the Westinghouse Electric & Mfg. Co. They are of the overlapping type, made of impregnated wood, and are of sufficient length to insure insulation at 11,000 volts. Each section insulator is carried upon two brackets mounted on poles spaced 10 ft. apart. As the trolley and messenger must both be completely insulated on opposite sides of the breaker, heavy strain insulators are introduced upon which the messenger is dead ended, the two insulators being connected across the gap by a heavy steel rod. This entire combination is supported upon standard insulators mounted upon the regular brackets. One of the breakers, that opposite the substation at Avon, is different from the above mentioned type, in that it is not of the overlapping type, it being necessary to absolutely separate the two halves of the trolley line in order to utilize the separate phases of the trolley current of each half.

The only feeders necessary are those connecting the substation with the trolley on opposite sides of this section break. The principal object of cutting the trolley into additional sections is to facilitate the locating of line trouble. The conditions of electric traction on this line are such that no feeder is necessary besides the trolley wire, and consequently there is no necessity for feeding the sections separately. A jumper is therefore provided at each section insulator in which is placed a hook type knife switch that can be operated in case it is desired to cut that section out. Normally, however, the switches are closed and the effect of the jumpers is to make the trolley wire continuous.

Another detail peculiar to the catenary type of trolley construction is the "deflector"—a sort of mechanical fender placed in the angle formed by the intersecting trolley wires at switches. The type of deflector here used consists of four or five bars of flat steel, ½-in. x ¼-in., suspended by riveted hangers from crossbars spaced 5 ft. apart which in turn rest on standard trolley clamps fastened to the trolley wire. The particular advantage gained by this construction is that no extra tension is needed to keep the bars from sagging and bending, this type of deflector being of minimum weight and entirely self-contained. They are placed in both angles of each switch. The object of the deflector is to prevent the end of the pantagraph shoe, when traveling under either wire, from becoming hooked over the other.

CARS.

The car equipment fitted with electric apparatus consists of six motor cars which together with their trucks were furnished by the St. Louis Car Company. The electrical apparatus was installed on the cars and trucks by the engineers at the railroad company's car shops in Buffalo, N. Y. The cars are 51 ft. 4 in. over bumpers, 40 ft. over corner posts, 29 ft. 4 in. between truck centers, 8 ft. 9 in. wide over sheathing, and 13 ft. 8⅝ in. in height above the rail. Four of the six have two passenger compartments, the other two having a baggage compartment about 14 ft. long, and a small smoking compartment with six seats, besides the regular passenger compartment.

The underframe of the cars consists of side sills of 5-in. x 8-in. yellow pine, with 6-in. steel channel fillers, intermediate sills of 4½ x 6-in. yellow pine, and center sills of 6-in. I-beams, with fillers. All the cars have upper and lower truss rods and needle beams of 5-in. I beams. End sills are 8-in. x 6-in. oak. The flooring is double, and trap doors are fitted over the motors.

All the lower side windows are equipped with sash balances,

and the interior of the car is finished in mahogany with light green veneering in the ceiling. The seats are of the "Walkover" type, upholstered in dark green plush in the main passenger compartment, and in rattan in the smoking compartment. There is a continuous basket rack on either side over the windows. The end doors are of the double sliding type and the vestibule doors are of the single sliding type, and trap doors are fitted over the steps. Each vestibule is fitted with a double-acting swinging door so arranged as to form the motorman's cab, and when not so used it is folded back to completely enclose the control apparatus and brake gear, and leaves the vestibule unobstructed for passengers.

Each car is fitted with a 50-candle power headlight, at each end, on top of the hood, and it is also fitted with a gong, air whistle, and with a standard train air signal used by the Erie Railroad. The toilet is in the center of the car, adjacent to the partition between compartments. The "Standard" steel type of platform buffer is used, and the regular M. C. B. coupling, air hose connections and safety chains are provided, so that the cars can couple up to any of the standard Erie railroad car equipment.

There being an open space between the abutting vestibules when two motor cars are coupled together, due to the rounded and projecting buffer beams of the platforms, this opening being nearly 18-in. wide, which is wide enough to allow a person to fall between the cars, there were provided canvas curtains about 5 ft. high with snaps attached which enable them to be quickly stretched across the space, one on each side of the vestibule end door, so as to insure the safety of trainmen and passengers when walking from one car to another, with the train in motion.

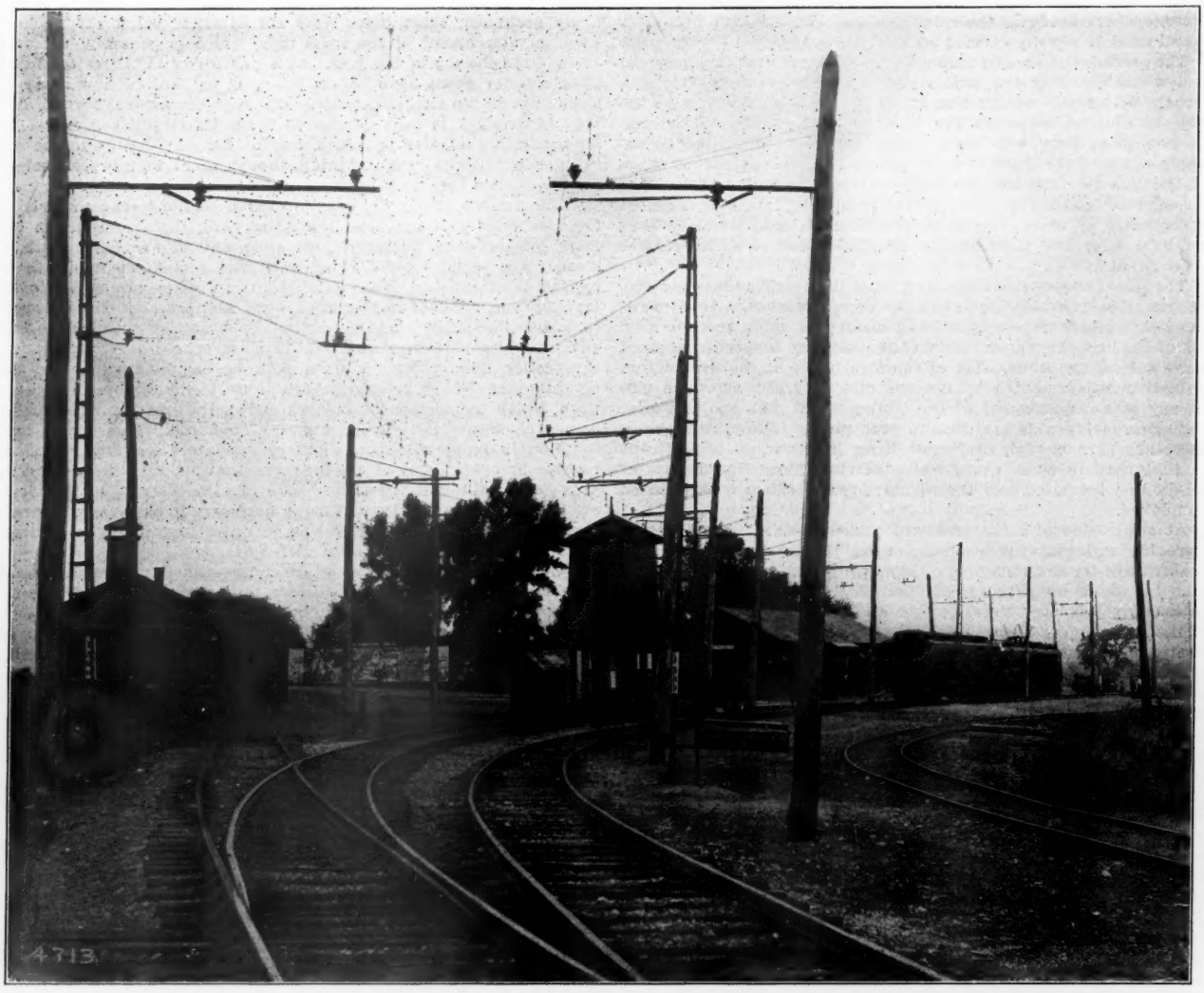
The trucks are both alike, the wheel base being 6 ft. 8 in. The axles are 6½-in. diameter. The trucks are of the standard M. C. B. swing bolster type and inside hung brakes.

The heating equipment consists of 32 Consolidated Car Heating Company's electric heaters of the truss plank type, 450 watts capacity each in the main portion of the car, and two "No. 192 M. S." heaters in each cab.

The electrical equipment of the cars consists of four No. 132-A Westinghouse single-phase railway motors, with a nominal rating of 100 h.p. each, the gear ratio being 20:63. The suspension is of the nose type, and solid gears are pressed upon the axles.

The control system is of the Westinghouse electro-pneumatic type, and includes three distinct circuits, the high potential, the low potential and the control circuit.

The high potential circuit includes the pantagraph trolley, line switch and the transformer. The pantagraph trolley mechanism is operated by a pair of springs and by an air cylinder. The trolley is raised and held against the wire by means of springs against its own weight, and it is lowered by the application of air pressure to pistons working in cylinders that form part of its base. When down it is automatically locked, and the latch of this lock can only be withdrawn by applying air pressure to another small piston which then unlocks the pantagraph allowing the springs to raise it. This trolley mechanism is so connected with the control circuit through the line relay that any interruption in the supply of high-tension current immediately causes the trolley to be lowered by applying the air to the main cylinders in the trolley base.



Overhead Construction at Mount Morris Terminal; Erie Railroad.

The line switch is equivalent to a main high-tension circuit breaker. It is opened and closed by air pressure, admitted by electrically-operated valves. In case the supply of air is exhausted, as when the car has stood for some time unused, the line switch must first be held in mechanically by means of a handle provided for the purpose until the air pump, which can then be thrown into operation, has compressed air to about 50 lbs. pressure, which is enough to properly actuate the control system. To raise the trolley when there is no air pressure, there is provided a small automobile tire pump placed underneath one of the car seats, which is connected by a three-way cock into the trolley air piping system, and enables the air-operated trolley latch to be withdrawn and power obtained that will start the air compressor and set going the motor generator set, which is used for charging the storage battery and supplying current to the control circuit.

The transformer is of 200 k.w. capacity, and is of the oil-insulated type. It has three high-potential and eight low-potential

taps, the latter running from 300 down to 110 volts, at which latter pressure current is provided for heating, lighting and auxiliary purposes.

The high tension wiring of the car is done mainly with varnished cambric cable, drawn through loricated iron conduit. A small amount of high grade rubber cable is used, but it is thoroughly protected with varnished cambric tape wherever there is danger of a brush discharge to ground breaking down the insulation.

In the main low potential circuit are the switch group, the preventive coils and the reverser. The switch group is a set of air-operated switches controlled by magnet valves, all mounted in one frame. It is placed athwart the car as near as possible to the low-tension end of the main transformer. The switches of the group are all provided with interlocks, which automatically govern the connections in such a way that each switch of the group acts only when the current in the motors has reached a predetermined value, thus making acceleration automatic. Preventive coils are used across the terminals of some of the switches of the group to prevent excessive current flowing at the instant of closing the switch. Each switch in the group is fitted with its own blow-out coil. There are two reverser switches actuated by air pressure, one for each pair of motors.

Current from the main motor circuit is led through the motor limit switch, which makes effective the functions of the interlocks on the switch group, and renders it impossible for the successive switches to be thrown in unless the limit switch is closed.

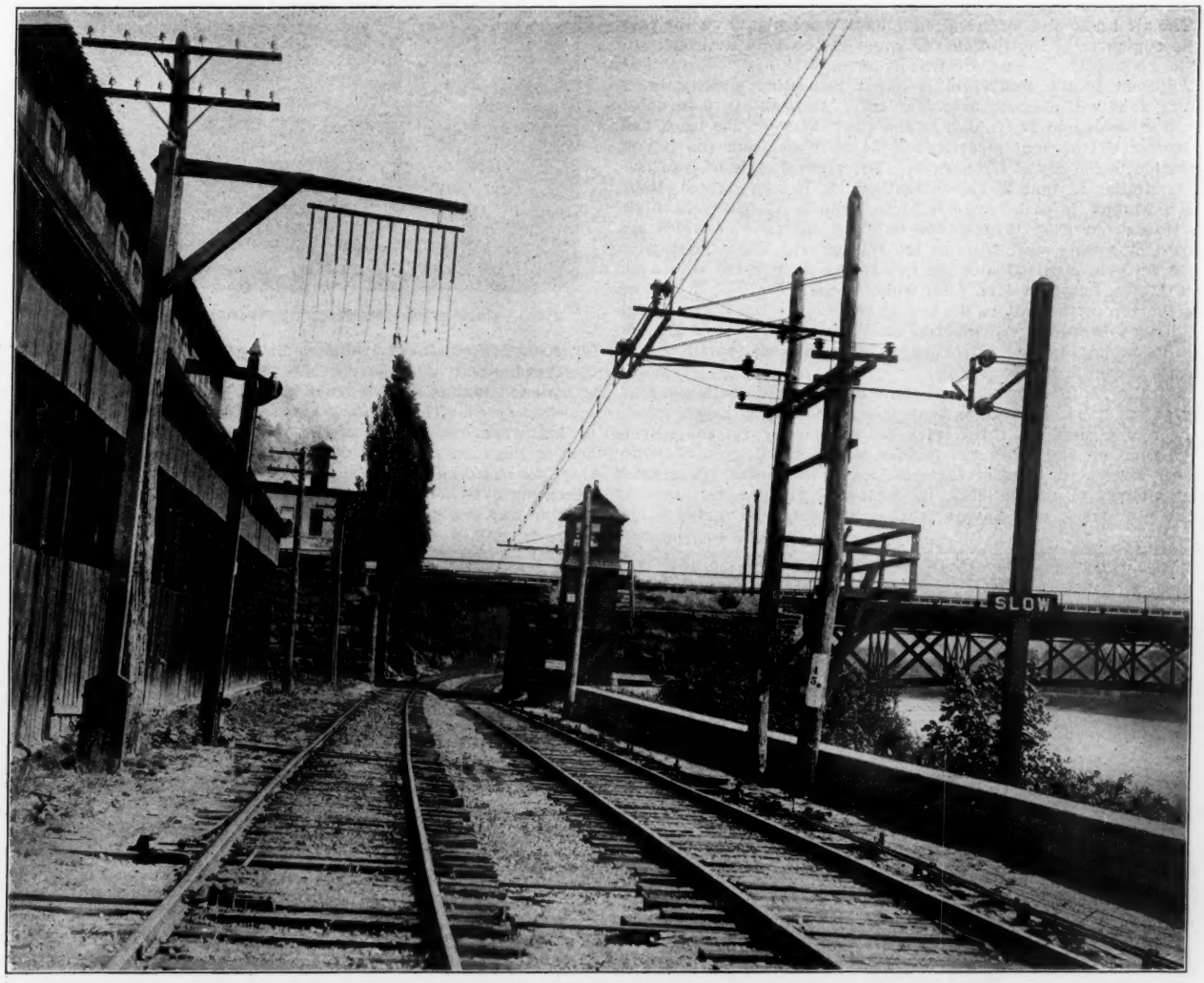
The control circuit includes a master controller, in each vestibule, the train line wires and their connections to the valve magnets and interlocks, a storage battery supplying current for these wires, and a motor generator set, which is used either to charge the batteries or to actuate the control system. The master controller makes the proper connections by means of which the 15-volt storage battery actuates the valve magnets which control the action of the air-operated main contactors in the switch group and the reversers. The controller handle is normally held in a vertical central position by springs unless it is moved to one of the running points by the motorman. When released from the grasp of the hand it flies to the vertical position, cutting off the power, and enabling the emergency application of the brakes by means of a brake relay valve alongside of it. There are two holes in the face of the master controller, directly under the handle, and attached to the handle by means of a chain is a plug which may be inserted into either of these holes. The master controller is not operative unless this plug is pushed all the way into the lower hole, which closes the line switch, connects the generator and battery, and puts the brake relay valve into circuit. This is the ordinary running position of the plug. In case the line switch is opened by an overload, which generally causes the trolley to be lowered, the plug is taken out of the lower hole and placed in the upper, which action immediately closes the line switch, releases the trolley, and allows it to spring up against the wire. As soon as the power is thereby returned to the main circuit the plug is taken out of the upper hole and replaced in the lower one.

There is a push button upon each side of the bottom of the master controller case. That on the right hand side is used for dropping the trolley and opening the line switch. When the button on the left-hand side is pressed, the switch group is stepped up to the last or high-speed notch and remains in that position until the handle of the controller has been returned to the off position.

There are four distinct notches on each side of the controller, the first corresponding to the coasting position, with the power off, the others enabling such gradations of speed as may be desired. Reversal is effected by moving the controller handle to the opposite side of the center or dead point. If the controller stops on the dead point, as it will if released by the hand, it will immediately apply the brakes.

The motor generator set is a compact machine of about $^1/_6$ k.w., the motor being of the self-starting induction type, wound for 110 volts, the generator being normally of about 23 volts. It is placed under one of the seats in the car, and is covered by a box with removable lid, so that it can easily be reached for such attention as it requires. It is mounted upon rubber bushings, and runs so quietly that its presence in the car can hardly be detected.

The storage battery consists of seven cells contained in a wooden



Overhead Catenary Construction at Clarissa Street Bridge, Rochester, Showing Section Break and Bridge Warning.

box with handles, carried in an enclosed box underneath the car. No other auxiliary lines for any purpose are connected to the control circuit in order to prevent it from being disabled by accidental grounds.

In one vestibule there is located in an asbestos lined compartment enclosed with steel doors, a slate switchboard panel upon which are carried all the switches and fuses for the control of the battery and motor generator set, the lighting circuits and heaters, and also the main connection from the low-tension side of the transformer to the auxiliaries.

The control circuit is fitted with junction boxes, branches running to receptacles at each of the four corners of the car directly under the end sills. The jumpers for connecting the cars and the receptacles are of the 12 point type, there being 12 wires in the main control circuit.

The low-tension wiring between the transformer and switch group and motors is all enclosed in a boxing of Transite, to insure its protection against mechanical injury, as the inductive effect of heavy currents at low potentials renders the use of iron conduits impossible for this part of the wiring.

The air brake and electrical equipment were placed on the cars by the engineers at the Buffalo car shops of the Erie Railroad.

CAR INSPECTION SHED.

Adjacent to the substation is a car inspection shed, a brick building that will accommodate four cars. It is 136 ft. 6 in. long, 30 ft. 5 in. wide and 20 ft. high in the clear, between the track and the bottom of the roof girders, and 24 ft. high from the top of foundation to the top of the parapet. The general style of construction is similar to that of the substation. It is well lighted, there being a window in each bay, 6 ft. 11 in. wide by 13 ft. 6½ in. high. Two tracks run clear through the building, the ends of which are enclosed by rolling steel doors of the Wilson type, about 12 ft. wide and 18 ft. 9 in. high. One of the two tracks is provided with a pit about 110 ft. long and 4 ft. 4 in. wide, in the clear, and 3 ft. deep from the top of the rail to the top of the convex brick floor. The roof is a 4¼-in. reinforced concrete slab, supported by steel girders, slightly pitched in one direction. There are no partitions or separate rooms in the building.

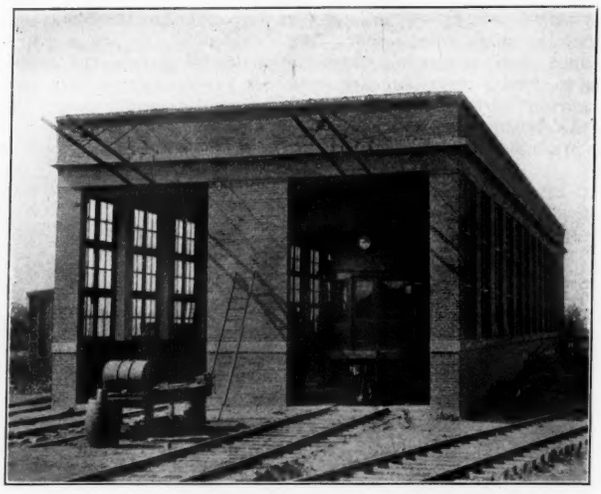
A trolley hoist is provided at the rear end of the building, traveling across it on the bottom flanges of an I-beam attached to one of the roof girders. A third track not connected with the outside tracks runs up and down the middle of the building between the two car tracks. A transfer table is located in a cross pit situated about midway of the building, by means of which a car standing on the floor track may have a truck taken out from under it and shifted over to the center track on which it can be run under the trolley hoist in case repairs are needed. The sides and bottom of this transfer pit are made of concrete. The floor of the car barn other than that taken up by the repair pit and transfer pit is paved with second grade paving brick, laid on sand, which was well packed down with water.

The station is supplied with light by 77 incandescent lamps in pairs and clusters, connected up by a conduit system and steel plate switch cabinet to the auxiliary light transformer in the substation. The pit is also provided with ten incandescent lamp outlets and extension plugs. No electrical means are provided for moving the cars in the station, there being always steam locomotives available for shifting the cars in and out of the building.

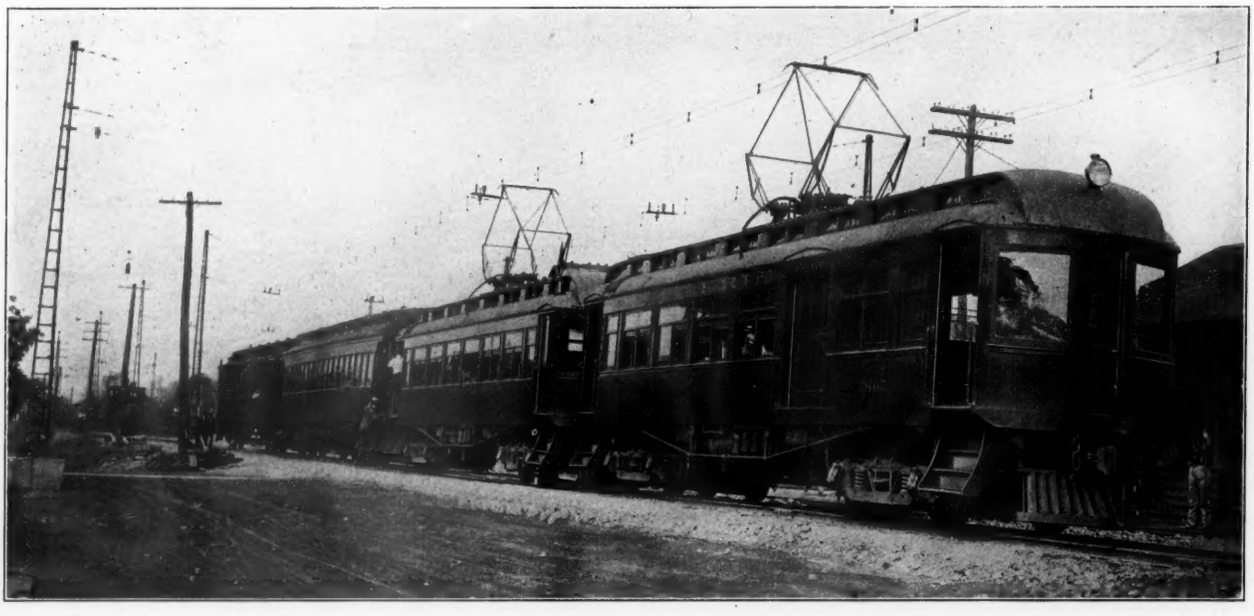
The facilities in the inspection shed for making electrical repairs are supplemented by the regular division repair shops, located alongside the steam locomotive roundhouse at Avon, which are equipped with the usual complement of machine tools. At the Rochester terminal a concrete inspection pit 60 ft. long is provided on one of the side tracks close to the passenger station.

OPERATION.

The equipment above described was intended to be sufficient for operating single-car trains with one stop per mile over the entire road, at an average schedule speed of 24 miles an hour, or to haul one trailer making stops about 2½ miles apart, at the same schedule speed. The company has furnished shelters where the public highways cross the line, there being 22 of these flag stations, besides the regular intermediate way stations at which steam trains stop, six in all, or a total of 28 stations at which electric cars may be required to stop. Practically the electric cars stop at all the regular way stations, but at only a portion of the flag stations. A single passenger coach is frequently attached to a motor car, and on some trains baggage, milk or postal cars are regularly hauled. When two trailers are hauled two motor cars are required, making a four-car train, as shown in the accompanying photograph. The service has proved very popular throughout the Genesee valley, through which the line passes, and it is intended to increase the number of motor cars in order to handle the business a little more comfortably next season. It is found that the electric trains on their 34 miles of line can be depended on to keep to their running time rather better than the steam passenger and freight trains operating over the main line.



Car Inspection Shed at Avon; Erie Railroad.



Four Car Electric Train at Avon; Erie Railroad.

SIGNAL SYSTEM.

The railroad company has installed the manual block system for insuring the safety of trains with the frequent headway at which they are obliged to be run upon the single track road, which must also handle steam passenger and freight traffic at the same time. The blocks extend between the regular way stations, or where such blocks are too long block towers are added, making the blocks average about four miles in length from one end of the line to the other. The siding switches are fitted with electric locks controlled by the block operators, in the towers, or in the way stations. The towers are all connected by the private telephone line, while the way stations retain the usual telegraphic communication with the train despatcher's office at Rochester. All train orders are transmitted by telegraph and written out on Form 31.

TELEGRAPH SYSTEM.

As is well known, the single-phase trolley system causes interference with telegraph lines, along the right of way, and unless both the electrostatic and electromagnetic induction are properly compensated, there is always danger of telegraphic communication being seriously affected. The static effect is particularly annoying, as it is absolutely continuous, as long as the trolley line is charged, whether or not there are any cars moving. Various means were proposed and tried by the Western Union Telegraph Company for the elimination of the static induction, which always causes the telegraphic relays to chatter, but the most successful thus far found was that devised by E. W. Applegate, quadruplex expert for the Western Union Telegraph Co., who has developed a very simple means for overcoming static interference. The Applegate "static pickup," for which a patent has been applied, comprises a back contact relay and a high resistance shunt. The current enters the relay 1 and 2, through a 150-ohm coil or magnet, attracting the armature C. When the line opens by any operator opening his key the armature C falls back and through the back contact connects point C and D by the aid of a spring S. The shunt A consists of 350 ohms of carbon stick and provides a better path for the static current than do the magnets, pacifying the magnets to a certain extent. When the line opens and the armature connects with the back stop C and D, both the A and B shunts are in series with the main line and pick up the static, which escapes through shunt A, relieving the agitation of the armature so that it can respond to the closing of the line. The shunt A robs the relay of main line battery current very materially, so that it responds to the home key sluggishly. Consequently the auxiliary battery F is inserted in shunt B. When the armature C falls back, this battery acts upon the magnets and assists its prompt response to the home key or to any other operator to such an extent that the shunt A does not cause noticeable drag. No matter what the line static may be these shunts "pacify" the instruments and the static is not felt.

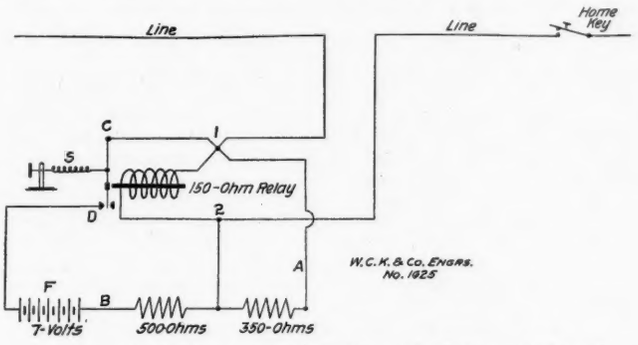
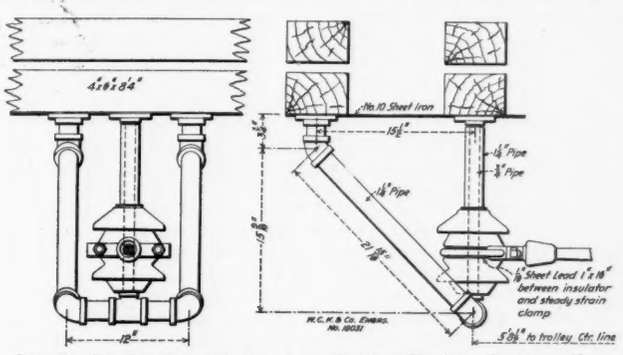


Diagram of Applegate Static Pickup for Telegraph Lines.



Steady Strain Bracket for Low Bridge Trolley Construction.

The armature spring is adjusted high enough to overcome the wave of static that escapes A and B shunts. The aid of the seven-volt battery overcomes this adjustment and leaves the relay very prompt and satisfactory.

The resistance of the shunt A must be determined by the distance from the ground and battery at each end of the line. The nearer to the ground the less is the resistance of the shunt, as in close proximity to battery and ground the static is more pronounced, and the effect of the main battery upon the relay is likely to be correspondingly diminished.

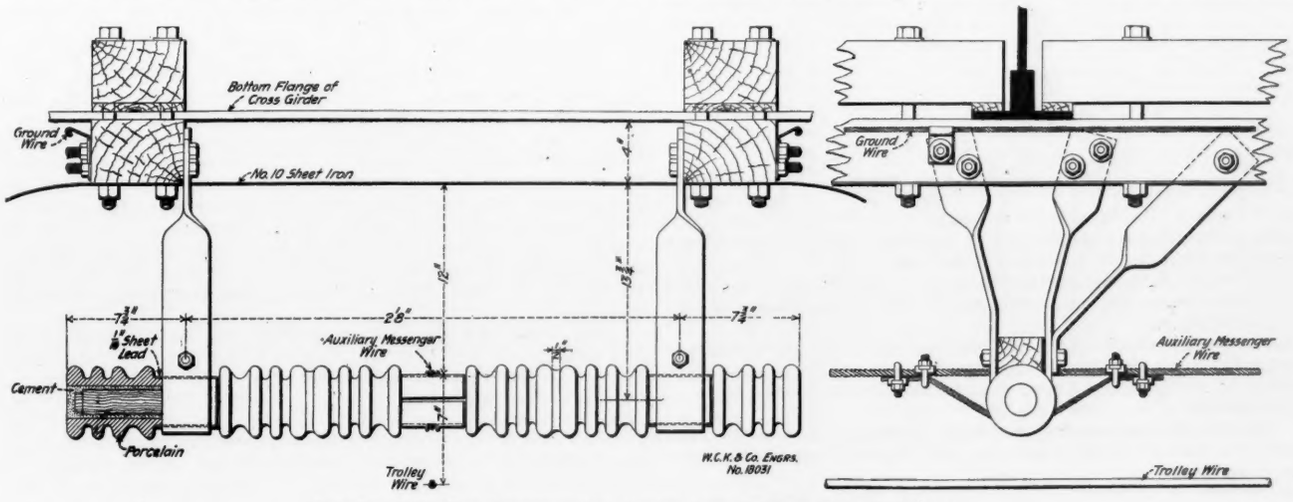
By this arrangement all the telegraph wires are "singled," and metallic circuits, the necessity for which was at one time pending, were discontinued, and the repeater service which they necessitated was also discontinued. There is now a spare wire between Rochester and Mt. Morris through the entire zone of static interruption.

Speech over the telephone line is very clear and distinct, and although the wires and instruments have a heavy static charge, a few simple precautions prevent any trouble. It is intended to carry portable telephones on the cars.

ORGANIZATION.

The single-phase system was recommended for the electrification of this division by the Electric Traction Commission of the Erie Railroad, and after authorization by the company was installed under the general direction of J. M. Graham, Vice-President and head of the construction department of the Erie.

The engineering and the construction work were carried out, and the system brought into operative condition by Westinghouse, Church, Kerr & Co., who designed and erected the buildings and the catenary trolley construction, bonded the track, and installed the electrical apparatus in the substation and on the cars.



Details of Trolley Construction Under Low Bridge; Erie Railroad.

The adjustment of the telegraph system was carried out jointly by the Western Union Telegraph Co. and the telegraph department of the railroad company.

The order was given to the engineers on June 6, 1906, and although the activity in construction work all over the country at that time rendered it difficult to secure materials and labor promptly, the work was pushed so rapidly that about 7½ months later, on Jan. 22, 1907, the first official trial trip was run between Avon and Rochester. The severe winter weather thereafter prevailing delayed the completion of the work until spring. During April and

May the whole equipment of substation apparatus, lines and cars was thoroughly tried out in a course of experimental operation, which also enabled the railroad employees to become familiar with the new system. On the 18th of June commercial operation began and has since continued permanently with marked success.

How to Remedy the Effects of Foreign Current on Automatic Block Signals.*

The present committee has carefully considered the report previously made to the Association and the discussion thereon. As the conclusions recommended by the previous committee were not acted upon by the Association, they are herewith re-submitted for adoption in the form recommended by the present committee. The conclusions now recommended are as follows:

1. For situations where foreign currents follow the track rails, although there may not be a crossing or connection with an electric road, it is recommended that the conditions be carefully studied and exact information obtained as to the course, direction, amount and pressure of foreign current and provision should then be made for removing or blocking out this current.

2. When there is a crossing of an electric road with a steam road, batteries must be placed at each end of steam road track next to crossing and battery current arranged to flow through the relay in direction with foreign current if the foreign current is found to flow in a definite direction. The connections, through block section for control signals, must be made by means of line wire circuits.

3. If there is sufficient foreign current to improperly work the track relay when an insulated joint has broken down, two relays should be used for each track circuit, one being placed at either end and connected in multiple arrangement. However, it should be understood that complete protection is not given by the multiple arrangement of relays, for if there is a broken rail or bond wire, a foreign current may energize the relay at one end of the section before the relay at the other end of the section has been shunted and thus cause the signal to give a clear indication when there was a train in the section.

4. To minimize as far as possible the effects of foreign current on line wire circuits, it is regarded as important that trunking be kept above the top of the ground, the rubber and other insulations be kept in first class condition, and the common wire limited to a length of 10 miles.

5. For multiple arrangement of track circuit relays, a resistance of 16 ohms is suggested for relay at battery end and 4 ohms for the relay at the other end of track circuit.

The resistance of the relay at the battery end of the track circuit that will give the best results is dependent upon the insulation of the track rails, the rail bonding and the voltage and ampere capacity of the battery. The recommended resistance of 16 ohms is deemed the best for those situations where the track circuit conditions may be considered good. For sections where the rail insulation is poor and batteries are not efficiently maintained, a lower resistance may be used to advantage if failures are to be kept within reasonable limits. The greater the resistance of the relay, the higher the voltage required to pick up the armature and the easier it will be to shunt the relay.

6. For track circuits having but one relay, a resistance of 9 ohms is recommended for circuits 500 ft. and under, and a resistance of 4 ohms for circuits of greater length than 500 ft.

While it is recognized that the best results are to be obtained by using a relay having a resistance proportioned to the resistance of the circuit, the benefits do not compensate for the disadvantage from a maintenance standpoint, of having to keep in stock track relays of a number of different resistances.

7. It is advisable to thickly coat with a heavy oil or other insulating compound the parts of an insulated joint before the joint is put in place.

If there is interference from foreign current, it is advisable to put a heavy oil or other insulating compound on the joint and particularly around the exposed ends of the fiber at least every two months.

8. For direct-current track circuit connections run in trunking, a $^5/_{32}$ in. rubber insulation wall for No. 8 B. & S. gage wire or larger is recommended.

9. For signal circuit connections run in trunking, a $^5/_{64}$ in. rubber insulation wall for No. 12 B. & S. gage wire is recommended.

10. Trunking, when run parallel with the track, should be kept clear of the ground. When run across tracks, trunking should be put in with top clear of the ballast and with top of capping not less than ½ in. below bottom of rail.

11. The standard ground should be made by burying in moist earth an annealed copper plate $^1/_{16}$ in. thick, 2 ft. square, to which has been brazed for a length of 12 in. a No. 4 B. & S. gage soft drawn bare copper wire. The plate to be buried in clay or in a 6 in. layer of fine charcoal, and the connecting wire is not to exceed 150 ft. in length. The effectiveness of the ground should be tested by a Wheatstone bridge.

12. If the effects of foreign current on D. C. track circuits cannot be overcome by the methods above outlined, the desired result can be secured by the use of alternating-current track circuits having the proper current frequency.

W. H. Elliott, Chairman; J. M. Waldron, J. D. Phillips, W. F. Follett, C. A. Christofferson, W. M. Post.

*Report of Committee No. 14, presented to the Railway Signal Association at Milwaukee Oct. 9.

Railroad Commissioners' Convention.

The 19th annual meeting of the National Association of Railroad Commissioners was held at Washington, October 8, 9, 10 and 11, Vice-President C. C. McChord, of Kentucky, in the chair. On the call of the roll by states on Tuesday morning, there were represented the following 19 states, together with the Interstate Commerce Commission and representatives of the Railroad Accounting Associations: Connecticut, Georgia, Illinois, Iowa, Kentucky, Maine, Minnesota, Montana, Nebraska, New Jersey, New York (first and second districts), North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Washington, Wisconsin. As in former years, the Association indulged in a number of long discussions on such subjects as rate making, uniform classification and the valuation of railroads which are not susceptible of profitable treatment in a meeting of this kind, and on which no useful results were accomplished. The most definite action taken was that on the report of the committee on safety appliances. This report, which was made by the Chairman alone, and was avowedly a rambling paper, declared that the block signals now in use have become inadequate, and that the most advanced (?) schemes for keeping trains constantly in communication with stations by electric currents and for providing absolutely perfect automatic provision against collisions should be put in operation on the railroads throughout the country. These over-enthusiastic demands appear, however, to have been discounted by the convention and the meeting finally resolved, unanimously that:

> The Congress of the United States be requested to enact a law to compel railroad companies, both steam and interurban electric roads, to protect tracks by an automatic block system to be approved by the Interstate Commerce Commission, a certain number of miles to be protected each year until all the main track lines shall be so protected.
>
> The members of this association pledge themselves to ask the assistance of the senators and representatives of the several states . . . and to seek the passage of a law by each state to accomplish the same end. . . .

These resolutions, it will be seen, are by no means conservative, though in spirit they are more so than the other declarations of the report. As many of the commissioners represent states in which hundreds of miles of road do not earn $2,000 per mile per year, the use of the word "automatic," in the first paragraph of the resolutions, is doubtless to be explained by the prevailing lack of knowledge as to the meaning of that word in railroad signaling.

A considerable proportion of the 283 pages of the proceedings is filled up with committee reports and essays; 18 pages are taken up with a paper by A. T. Gillette, of New York, on the Valuation of Railroads and the discussion thereon. Mr. Gillette has been employed in a valuation for the state of Washington during the past year. James Peabody, of the Atchison, Topeka & Santa Fe, gave a talk on Uniform Classification, expounding his theory of how to make one. The Committee on Statistics, on which are Prof. Henry C. Adams, Prof. B. H. Meyer and Mr. C. I. Sturgis, made a long report, with copious appendices showing what the different states require in annual reports from railroads, and a paper by S. L. Lupton showing in great detail the features in which uniform action by the different states is desirable. Prof. B. H. Meyer contributed a ten page paper on the analysis of railroad operating expenses.

The Committee on Uniform Classification made a long report and again demanded that Congress authorize the Interstate Commerce Commission to prescribe one. The report of the Committee on Legislation, presented by M. S. Decker, of New York, declares that the time has come when this association, now 18 years old, should carry out its original purpose of securing harmony in railroad legislation. The need of securing greater safety to railroad passengers and employees, and to persons at highway crossings, alone constitutes a pressing demand which should receive the earnest attention of the Association.

The report of the Committee on Rates and Rate Making, presented by Mr. Staples, of Minnesota, fills, with the discussion thereon, about 30 pages; but we cannot discover that any new light is thrown on the subject.

C. C. McChord, of Kentucky, was chosen President of the Association for the ensuing year, and William H. Connolly, of Washington, D. C., Secretary. Mr. Connolly is Chief Clerk of the Interstate Commerce Commission. He takes the place of Mr. Moseley, who is no longer able to give the time necessary to attend to the duties of the secretary of the Association.

GENERAL NEWS SECTION

NOTES.

At Los Angeles, Cal., the Atchison, Topeka & Santa Fe has been found by a jury guilty of paying illegal rebates on freight.

Governor Comer, of Alabama, has issued his call for an extra session of the Legislature November 7, to further regulate the railroads.

The Indiana State Railroad Commission has determined to take upon itself the distribution of coal cars to the mines on the Southern Indiana Railroad.

According to newspaper reports, the Chicago & Alton has had to dismiss seven train auditors for co-operating with ticket scalpers —or, in plainer language, for stealing.

The Wisconsin Central has issued notice that until further notice 90 days' free storage will be given on all carload or L. C. L. shipments, up to the extent of the available space.

It is announced that trains of the Baltimore & Ohio will run to and from the new union station at Washington, D. C., October 26. The Pennsylvania will begin using the station three weeks later.

Near Middletown, N. Y., on Monday last a trestle on the Erie & Jersey Road, a new line under construction, broke down beneath a work train and 20 men were seriously injured, six of them fatally.

It has been informally announced that the tunnel under the East river, New York, from the Battery to Borough Hall, Brooklyn, will be in regular operation by January 1 and to the Long Island Railroad station by May 1.

The Chicago, Rock Island & Pacific Railroad Company has withdrawn its appeal to the Supreme Court of the United States in its controversy with the Territory of Oklahoma over the question of wheat rates.

In Kansas certain railroads have asked permission from the state authorities to collect 3 cents a mile from passengers who board trains without tickets. In Illinois this is permitted by a clause in the 2-cent law passed this year.

At the opening of the present college year, there were 415 freshmen registered in the Sheffield Scientific School of Yale University and 383 in the Academic department. This is the first time that the Sheff. registration has exceeded the Academic.

The Canadian Pacific has made an increase in the pay of telegraph operators of 12½ per cent. The Atchison, Topeka & Santa Fe has increased the pay of telegraph operators an average of 8 per cent., and of apprentices in the shops 20 cents a day.

The Grand Trunk has notified all trainmen that they are to take eight hours rest after 16 hours on the road, under penalty of dismissal. Rather than have trainmen start out without sufficient rest, the company would prefer to omit running that train.

The Lusitania, of the Cunard Line, on her second westbound trip, which was made last week, crossed in 4 days, 19 hrs. and 52 min., having made an average speed of 24 knots per hour. The largest single day's run was 617 knots. Each of these figures beats all previous records.

Conductors of the Chicago, Milwaukee & St. Paul in Wisconsin have received a circular calling attention to the legal liability of conductors who carry passengers, either adults or children, at less than the published rates. Stress is laid on carrying children over 12 years at half-fare rates.

At Jackson, Miss., Judge Potter has fined four railroads $100 each for failing to file with the Railroad Commission reports of the number of passes issued. All of the roads pleaded guilty, though they had not been furnished with blanks by the state; one at least had made a request for blanks but without result.

The State Railroad Commission of Texas has issued to the railroads new rules under which they are to keep their accounts and make their reports to the Commission. The rules, it is said, are so different from those prescribed by the Interstate Commerce Commission that the railroads are going to protest against their enforcement.

In the Federal Court at Kansas City October 11th the Secretary of State of Missouri was enjoined from attempting to forfeit the charter of the Chicago, Milwaukee & St. Paul. The offense of the railroad on which the Secretary proposed to act was that of transferring to the Federal Courts damage suits filed against it in the State Courts.

The telegraph school of the Pennsylvania Railroad at Bedford, Pa., although less than a month old, has already been enlarged to accommodate the increasing number of students. Fifty more instruments have been put in and there is to be a miniature railroad to illustrate the working of the block system. The Erie Railroad has established a telegraph school at Kenton, Ohio, and, according to the newspapers, will continue the salaries of clerks now in the employ of the company, who go there to take instruction in telegraphy. The company will also pay their expenses while at school.

Offers of promotion and high wages by the Great Northern and Northern Pacific on new branch lines have led some Burlington firemen and brakemen to seek similar positions with the northwestern roads named. A number of the employees of the Galesburg division have gone west because of a recent change which would compel them to transfer to other divisions.

At Hartford, Conn., Conductor Maroney and Engineman Wilson, who were responsible for the collision near that city June 23, causing the death of ten laborers on a work train, have been convicted on a charge of manslaughter and sentenced each to nine months' imprisonment. At St. Thomas, Ont., October 9, an engineman of the Wabash Railroad was sentenced to six months' imprisonment for causing a fatal accident on that road in August, 1906.

The railroads centering in St. Louis have finally agreed to absorb the bridge toll on the Eads bridge for all freight shipped to St. Louis or East St. Louis from a distance exceeding 100 miles, by whatever conveyance the freight is carried across. That is to say, consignees' or truckmen's wagons hauling freight across the bridge will be relieved of the toll the same as in the case of freight which is carried across in freight cars. The same rule applies to outward freight.

Arthur Hale, Chairman of the American Railway Association Committee on Car Efficiency, has issued Bulletin No. 7, showing surpluses and shortages of freight cars September 18 and October 2. As compared with previous reports, this one shows marked decreases in the surplus and corresponding increases in shortages. The number of roads reporting on October 2 was, however, 23 less than on September 18, so that the difference between these two days is not particularly instructive.

Oren Root, General Manager of the New York City Railway, testifying before the State Public Service Commission concerning the number of cars run on important surface lines in the city, complained of as being insufficient, says it is impossible to get competent motormen. The company is paying higher wages than any other in the East, and yet cannot run all the cars that it desires to. The men are paid overtime and work as long hours as they can. Mr. Root said that he had advertised in the New York and Philadelphia papers for men, with meager results.

An officer of the New York Central, referring to the inquiry now being made by the New York State Public Service Commission concerning freight car service, says that at the New York City Terminals of the New York Central, beginning next month, an increased charge is to be made for the use of cars occupied by produce dealers, who use the cars as distributing depots. Some dealers in vegetables go so far as to live in their cars day and night for a number of days after arrival in New York, peddling out their wares to hucksters who take a small wagon load at a time to sell on the streets of the city. The Central proposes on the fifth and sixth days to charge $3 per car per day; on the seventh and eighth days $4, and thereafter $5.

It developed at the first day of the extended hearing which the Interstate Commerce Commission has begun on the proposed uniform bill of lading that whatever action the Commission may take, the bankers of the country will make a united demand on Congress at its next session to legislate "order" bills of lading into the same class as bills and notes and give them the same legal protection as all negotiable instruments. The long-standing complaint of the banking interests was voiced at the hearing by R. E. L. Marshall and Samuel Williston. They explained with precision to the Commission that the crops of the country are moved each year on loans from the banks on bills of lading which the banks but not the courts regarded as negotiable. The legal uncertainty of such a custom, which has become a commercial necessity, is an evil demanding relief, hence the resolution of the bankers to go to Congress.

Cleveland, Chicago, St. Paul and North Platte, Neb., report serious congestion of freight; and the usual fall rush, in less pronounced form, is reported from many other places. At Cleveland coal dealers and manufacturers are severely hampered in their business because coal cars are so scarce. From Chicago eastward the grain movement is reported so heavy as to greatly interfere with the movement of other commodities. The Union Pacific main line throughout Nebraska is crowded with trains and North Platte merchants had not received a carload of freight for a week. At St.

Paul the congestion is hurting the jobbing interests. The situation is becoming worse than it was a year ago. The building of several hundred miles of branch lines in North Dakota this season, without a corresponding increase in rolling stock, is said to be largely responsible for the present condition. The lines appear to have cars enough, but are deficient in motive power. And to this difficulty is added the strike of machinists from St. Paul to the Pacific coast.

United States Express Company Dividend.

The United States Express Company has declared a semi-annual dividend of 3 per cent. on its $10,000,000 stock, putting it on a 6 per cent. basis. It has heretofore been paying 4 per cent. annually.

Brooklyn Ferry Service to be Abandoned.

The Brooklyn Ferry Company of New York, which went into the hands of a receiver on October 16, 1906, is about to abandon service on its seven lines of ferries across the East river. The property has not yet been sold. The sale under foreclosure was ordered last December and it was then offered to the city for $13,000,000, but the city refused. The company owns five lines, running from the foot of Broadway, Brooklyn, to Roosevelt, 23d, 42d and Grand streets, Manhattan, and from Grand street, Brooklyn, to Grand street, Manhattan. It leases the two lines from Greenpoint avenue, Brooklyn to 10th and 23d streets, Manhattan.

The ferry company at the time of its failure operated 18 boats of its own and leased five, but the competition of the new Williamsburg bridge proved too much for the old ferry service. The company has outstanding $8,500,000 capital stock and $6,500,000 bonds. On August 1, 1906, the company defaulted the interest on the bonds and also certain ferry rentals. A committee of reorganization was formed then, but it now seems that the receiver is convinced that the successful reorganization of the company is impracticable.

Disastrous Derailment at Shrewsbury, England.

A press despatch of Tuesday last reports the derailment of a passenger train while passing over a curve at high speed on the London & North Western, at Shrewsbury, early on the morning of that day, killing ten passengers and six trainmen and mail clerks and injuring a large number of persons. The derailment occurred at a point where the speed limit rule is 10 miles an hour. The engine and all of the cars but one were wrecked.

New Hudson River Steamboat Line.

The New York & Albany Transportation Company has been incorporated to operate a line of freight and passenger steamboats between New York and Albany. The company has bought two boats, one of which is the Saratoga, formerly on the Troy Line. Wharfs have been secured in Albany, and the New York terminal is to be arranged for soon. Both a day and a night service may be started by next April, and perhaps the company will ultimately run lines to Long Island Sound and points on the Atlantic coast.

Short on Theory; Long on Practice.

As a supplement to our report of the convention of railroad commissioners at Washington we copy the following from the *New York Commercial*: "Commissioner Stanton, Montana's representative, sketched the history of Montana, told two or three stories, related thrilling experiences of the early pioneers and toward the conclusion of his speech said a thing or two about railroad regulation. He told the convention frankly that he was a novice at the railroad game.

"'Our board was established seven months ago,' he said. 'We're new at the business out in Montana, but we are doing things; we're short on theory, but long on practice. There was a road out there that refused to run a train. We ordered them to do it. They did. That road,' he continued with a smile, 'won't make any money for years to come.' This statement brought down the house.

"'The pioneers went into Montana in order that their descendants might wear patent leather shoes and ride in automobiles. We intend to see to it that everybody is afforded an opportunity to ride on the steam cars. * * *'"

INTERSTATE COMMERCE COMMISSION RULINGS.

Coal Rates on Burlington Upheld.

The Interstate Commerce Commission, in an opinion by Chairman Knapp, has announced decision in the case of the Albany Produce Co. v. the Chicago, Burlington & Quincy. In their petition complainants alleged that the rate exacted by defendant for transporting coal in carloads from shipping points in the Centerville district, in Iowa, to Albany, Mo., is unreasonable, and is greater than the rate charged for carrying coal in carloads from said shipping points through Albany to St. Joseph, Mo., and that this adjustment of rates subjects complainants and the city of Albany to undue prejudice and gives to the locality of St. Joseph, and coal dealers therein, undue preference.

At the time their complaint was heard defendant's rate on coal from the Centerville district to Albany was $1.25 per net ton, and to St. Joseph 70 cents per net ton, but after the case was submitted defendant voluntarily reduced its rate from the Centerville district to Albany to $1 per ton. The Commission found that so far as shown by the evidence there is no competition between Albany and St. Joseph. St. Joseph ships no coal to Albany, Albany ships no coal to St. Joseph, and neither competes with the other in common territory for the sale of coal. Albany is not in reality interested in the rates to St. Joseph except as they afford a basis of comparison. The Commission declared that there is practically nothing in the record to warrant a finding that the $1.25 rate was unreasonable in itself, or that the present rate of $1 is excessive. It also held that it is equally evident that the charge of unjust discrimination has not been established. The case presented by the record did not indicate the violation of any provision of the law and the complaint was therefore dismissed.

An Unsupported Complaint from Dallas.

The Commission, in an opinion rendered by Commissioner Harlan, has announced its decision in the case of the Dallas Freight Bureau against the Missouri, Kansas & Texas and others. The complaint involved rates on agricultural implements, axes, pig iron, whisky and other commodities from St. Louis to Dallas. Complaint was also made of the rates on sugar, molasses and glucose from New Orleans to Dallas. The Commission held that the record disclosed no sufficient basis for an order, and the complaint was dismissed without prejudice; and it was further decided that: the Commission is authorized under the act to order a reduction in rates only when upon complaint made it is of the opinion that such rates are unjust, or unreasonable, or unjustly discriminatory, or unduly preferential; complainants must therefore prove the issues that they raise or make out a prima facie case sufficiently clear and strong to require the Commission in the public interest to enter upon an investigation of its own motion. Neither of these requirements is satisfied by a comparison, without any other showing, of the rates complained of, from St. Louis to Dallas, with rates between points in other and distant localities where different physical, competitive and traffic conditions exist. Shippers have ample opportunity for personally laying their troubles before the Commission and thus showing the actual results of the rates complained of upon their business. In this case no person interested in such rates appeared as a witness, and the only testimony offered was that of the secretary of a freight bureau having no personal knowledge of the effect of the rates upon the merchants dealing in the commodities involved and whose testimony is limited to a comparison of the rates attacked with rates on the same commodities for equal distances in other parts of the country, where the traffic is much more dense.

Commissioner Clements did not concur in the conclusions of the Commission.

MANUFACTURING AND BUSINESS.

The Fort Pitt Bridge Works, Pittsburgh, Pa., has opened an office in Chicago with A. R. Young, C.E., in charge. He is located in the Fisher building.

The Duff Manufacturing Company, Pittsburgh, Pa., has an order from the South Manchurian Railroad for 450 Duff ball-bearing screw jacks of 35-lbs. capacity.

The Washington Terminal Co. has ordered, for use in its new shops just built in Washington, a large number of double and single swivel vises from The Pittsburgh Automatic Vise & Tool Co., Pittsburgh, Pa.

The Central Inspection Bureau, New York, is inspecting a number of electric double-truck passenger and express cars for the Buffalo, Lockport & Rochester at the works of the Niles Car & Manufacturing Co., Niles, Ohio.

The Cutler-Hammer Manufacturing Co., Milwaukee, Wis., which some months ago bought the Wirt Electric Co. of Philadelphia, has consolidated that business with its New York plant at Park avenue and 130th street, where the manufacture of Wirt apparatus will be continued.

The Central Inspection Bureau, New York, has just finished inspecting a large number of flat bottom gondola cars for the Newburg & South Shore at the works of the Pressed Steel Car Co. The bureau has a contract with the Emlenton Refining Company for inspecting a number of tank cars at this same plant.

The Marion Steam Shovel Company, Marion, Ohio, is now turn-

ing out about 30 shovels a month. A few months ago the company made its first contract with the Isthmian Canal Commission, and it has now submitted to the commission bids for some 100-ton shovels for which contracts have not as yet been awarded.

G. L. L. Davis has resigned as General Sales Agent of the General Castings Co., Verona, Pa., to become General Sales Agent of the U. S. Metal & Manufacturing Co., 25 Broad street, New York City. Mr. Davis has been identified with the railroad supply business for a number of years.

Charles Hansel & Co., 43 Wall street, New York, have been engaged by the North Platte & Encampment Canal Co. to make the surveys, plans and estimates and to take charge of the building of a canal for irrigating 93,000 acres of land extending from Saratoga, Wyo., south to the Colorado state line. The canal is to have a capacity of 1,000 cu. ft. per second. A hydro-electric plant will also be built.

Dr. E. Rosenberg, whose book "Electrical Engineering" was reviewed in the *Railroad Gazette* of September 27, is no longer Chief Electrical Engineer for Körting Bros., Hanover, Germany. He is now an Electrical Consulting Engineer, with an office at Kirchstrasse 5, Berlin, N. W. Dr. Rosenberg has had long experience in large electrical manufacturing works and is particularly well-known for the Rosenberg direct current and train lighting generators, several hundred of which are in operation in Europe and Asiatic Turkey.

S. J. Bowling, Manager of the railroad and steamship department of The Philip Carey Manufacturing Co., Lockland, Cincinnati, Ohio, has moved into new offices at 1327 Majestic building, Detroit, Mich. The company is carrying out its contract for pipe covering at the new Washington Union Station, where it will apply about $75,000 worth of 85 per cent. magnesia covering. It has just finished a contract for the St. Louis & San Francisco for flexible cement roofing and is now applying about 20 carloads of roofing at the National Tube Company's plant at McKeesport, Pa.

The Pilling Air Engine Co., Detroit, Mich., maker of pneumatic hoists, locomotive turntable motors and compressed air hoisting machinery, will change its name to the Detroit Hoist & Machine Co., a new corporation with $50,000 paid up capital stock. The old company will still exist with a nominal capital to protect the name and good will. Both companies will be controlled by the same management. The new plant is in operation. Other improvements will be added in the near future, provision for same having been made by buying three acres of ground on the Grand Trunk at Milwaukee Junction, one of the best shipping points in Detroit.

The More-Jones Brass & Metal Co., St. Louis, Mo., has patented a new process for making bronze and brass bearings. No sand is used in this method, so the danger of grit is avoided. The bearings are cast in composition metallic molds, so made as to avoid cold shot and keep the metal thoroughly mixed. Part of the floating top is drawn off to take away impurities that might be in the metal and to leave the bearing of uniform heat, thus avoiding shrinkage and producing a uniform material. Comparative tests show the material when cast by this process to be 30 to 50 per cent. stronger in both cross-breaking and compression strength, varying with the difference in composition. The specific gravity of the metal is 5 per cent. greater. It is claimed that the bearings cast in the patented process show 40 to 50 per cent. less wear on the metal and the shaft. The cost of manufacture is not larger than formerly.

Iron and Steel.

The Wisconsin & Northern has given an order for 5,000 tons of rails.

The Terminal Railroad Association of St. Louis has ordered 2,500 tons of rails.

The American Bridge Company has an order for 1,000 tons of steel from an electric line for a bridge over the Youghiogeny river.

The Atchison, Topeka & Santa Fe, it is reported, has ordered a large quantity of rails from the Colorado Fuel & Iron Company; also 6,000 tons from the Illinois Steel Company.

OBITUARY NOTICES.

Colonel F. St. J. Lockwood, President of the Danbury & Norwalk, which owns the road operated as the Danbury branch of the New York, New Haven & Hartford, died on October 12 at the age of 82.

Alexander M. Fox, a Director of the Pennsylvania, died at Philadelphia last week. Mr. Fox was 83 years old. He was the oldest Director of the company and was first elected to that office to represent the city of Philadelphia's interest in the road.

Albert C. Murdock, Division Engineer on the Pacific extension of the Chicago, Milwaukee & St. Paul at Ellensburg, Wash., died suddenly on October 6. Mr. Murdock was 37 years old. Before going to the St. Paul a year ago, he was locating engineer on the Northern Pacific at Tacoma, Wash.

MEETINGS AND ANNOUNCEMENTS.

(For dates of conventions and regular meetings of railroad conventions and engineering societies, etc., see advertising page 24.)

American Society of Civil Engineers.

At the meeting of this society, October 16, a paper was presented on the Bracing of Trenches and Tunnels, with Formulas for Earth Pressures, illustrated with lantern slides, by J. C. Meem. This paper was printed in the *Proceedings* for August, 1907.

American Society of Mechanical Engineers.

At the meeting of this society November 12, the principal address will be made by Charles R. Pratt on the Gearless Traction Electric Elevator, which is being installed in the Singer and Metropolitan Life, New York's two highest buildings. The paper will be discussed by engineers and architects from New York, Philadelphia and Chicago, and members of all professions are invited to attend.

American Railway Association.

A special meeting of this Association will be held at the Waldorf-Astoria Hotel, New York City, October 30, to take the place of the regular session appointed to be held at Norfolk October 23. All business intended to be taken up at the regular fall session will be considered at New York. Reports will be presented by the Executive Committee and the Committees on Train Rules, on Car Service, on Safety Appliances, on Signals, on Statistical Inquiry, on Standard Cipher Code, on Transportation of Explosives, on Standard Rail and Wheel Sections, on Standard Location for Third Rail Working Conductors, and on Car Efficiency. A First Vice-President will be elected.

General Passenger Agents.

The American Association of General Passenger and Ticket Agents held its 52d annual convention at Washington beginning on Tuesday of this week. The feature of the first session was an address by President W. W. Finley, of the Southern Railway. Mr. Finley characterized the demand for increased passenger service at decreased prices as a "hysterical wave of political agitation." The absence of complaints of high passenger rates in specific cases, especially when the public had been provided with federal and state commissions to receive such complaints, Mr. Finley regarded as significant. The convention began its business with a lively discussion of what was universally denounced as the inferior quality of ticket paper now in general use.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Albany & Susquehanna.—Henry E. Cooper has been elected a Director, succeeding J. H. Rhoades, deceased.

Arkansas, Louisiana & Gulf.—Officers of this company, which is building from Monroe, La., to Hamburg, Ark., 57 miles, are as follows: Chief Engineer, E. T. Bond, with office at Bastrop, La.; Superintendent, W. J. Hillyer, with office at Monroe; Auditor, L. E. Smart, with office at Monroe, and Assistant Auditor, V. G. Savage.

Atlanta, Birmingham & Atlantic.—H. M. Atkinson, President, has been appointed also General Manager, succeeding to some of the duties of G. D. Wadley, who remains Second Vice-President in charge of construction.

Boston & Maine.—Henry M. Whitney has resigned from the Board of Directors.

W. T. Roden has been appointed Auditor of Disbursements.

Central of Georgia.—C. E. James, Chattanooga, Tenn., and R. E. Steiner, Montgomery, Ala., have been elected Directors.

Chicago, Indianapolis & Louisville.—The authority of the general officers has been extended over the Indianapolis & Louisville, which is an extension recently opened for traffic from Wallace Junction, Ind., to Shirley Hill, 55 miles.

Delaware & Eastern.—J. L. Greatsinger and J. W. Griggs have been elected Directors, the Board being increased from 12 to 14 members.

Delaware & Hudson.—L. H. Stewart, Comptroller, has resigned on account of ill health. Mr. Stewart has been with the Delaware & Hudson for 33 years. W. H. Davies, Assistant Comptroller, is in charge of Mr. Stewart's duties for the present.

Grand Trunk Western.—W. G. Brownlee, General Transportation Manager of the Grand Trunk, has been elected a Director of the Grand Trunk Western.

Indianapolis & Louisville.—See Chicago, Indianapolis & Louisville.

Panama Railroad.—H. J. Slifer, formerly General Superintendent of the Central district of the Chicago, Rock Island & Pacific, and more recently Consulting Engineer in New York, has been appointed Assistant to the President of the Panama Railroad, with office at Colon.

Union Pacific.—William Mahl, Comptroller, has been elected a Director, succeeding David Willcox, deceased.

Western Maryland.—Edwin Gould has been elected a Director, succeeding James H. Hyde.

Operating Officers.

Arkansas, Louisiana & Gulf.—See this company under Executive, Financial and Legal Officers.

Chicago & North-Western.—L. W. Easterly, Trainmaster at Boone, Iowa, has been appointed Trainmaster at Council Bluffs, Iowa. P. W. Aishton, Trainmaster at Eagle Grove, Iowa, succeeds Mr. Easterly. S. A. Morrison, Trainmaster at Chicago, has been appointed to the new office of Trainmaster at Clinton, Iowa. J. G. Cowan, Trainmaster of the Peoria division, succeeds Mr. Morrison. A. L. Crabbs, chief despatcher of the Galena division, succeeds Mr. Cowan, with office at Chicago.

Cincinnati, New Orleans & Texas Pacific.—Warren S. Andrews, who was recently appointed General Superintendent of Transportation, was born at Salem, Ill., in 1865. After leaving high school in 1882 he began railroad work as a messenger boy on the Illinois Central. The next year he went to the Ohio & Mississippi, now part of the Baltimore & Ohio Southwestern, as an operator, and was later made train despatcher. In 1886 he was made a train despatcher on the Great Northern, and in 1893 returned to the Illinois Central as train despatcher. Six years later he was made Trainmaster on this road at Champaign, Ill., and was then later transferred to Carbondale. In 1902 he went to the Southern, where he served as Trainmaster at Charlotte, N. C., and later as Assistant Superintendent at Alexandria, Va., and at Greensboro, N. C. He was appointed Superintendent of the Washington division of this road in the fall of 1903, and in 1905 was transferred to the Danville division. Last winter he was appointed Assistant to the General Manager of the Cincinnati, New Orleans & Texas Pacific, where he remained until his recent promotion.

W. S. Andrews.

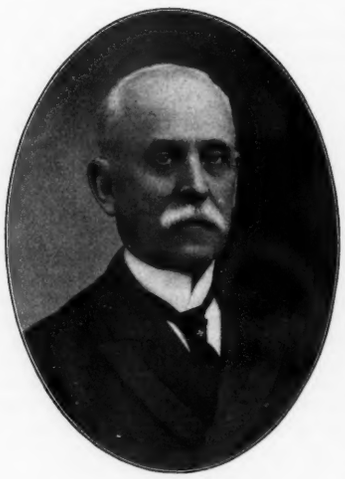
Grand Trunk.—David Crombie, who was recently appointed assistant to the general transportation manager, was born at Hamilton, Ont., in 1864. After a high school education he began railroad work in 1882 as a telegraph operator on the Grand Trunk. He later became train despatcher and in 1890 went to the Flint & Pere Marquette, now part of the Pere Marquette, as train despatcher and car distributor. Four years later he was appointed car service agent and then Superintendent of Car Service on this road. In 1900 he was appointed Superintendent of Transportation of the Pere Marquette and three years later went into private business at Chatham, Ont. In 1907 he returned to railroad work as Master of Transportation of the Grand Trunk at London, Ont., which position he held until his recent promotion.

H. E. Whittenberger, who was recently appointed Superintendent of the Grand Trunk at Montreal, Que., was born in 1864 at Peru, Ind. He began railroad work in 1885 on the Wabash. In 1897 he was made Trainmaster of the Middle division of the Grand Trunk, and in 1902 went to the Denver & Rio Grande as Superintendent. In 1904 he was appointed Superintendent of the Cincinnati, Hamilton & Dayton, and in 1906 went to the Kansas City Southern as Superintendent, where he remained until his recent appointment.

Missouri, Oklahoma & Gulf.—E. B. Fisher has been appointed General Superintendent, with office at Muskogee, Ind. T., succeeding A. N. Leitnaker.

Mobile, Jackson & Kansas City.—A. F. Church has been appointed Superintendent at Laurel, Miss., succeeding J. D. Patterson, resigned to go to the Southern.

New York, New Haven & Hartford.—O. M. Shepard, who was recently appointed Assistant to Vice-President John F. Stevens, was born at Cleveland, Ohio, in 1842. His first railroad work was in the United States government military telegraph and railroad service, which he entered in 1863. After becoming Superintendent of Telegraph he was, in 1870, appointed Master of Transportation and later Assistant Superintendent of the Gilman, Clinton & Springfield, now part of the Illinois Central. In 1874 he was made Assistant General Superintendent of the St. Louis & Southeastern, now part of the Louisville & Nashville, and six years later was made Superintendent of the New York & New England, now part of the New York, New Haven & Hartford. In 1882 he was made Division Superintendent on the New York, New Haven & Hartford, and was later made Assistant to the President. In 1886 he was appointed General Superintendent, and in 1890, the mileage of the system being much greater, was made Superintendent of the New York division and his former office was abolished. In 1903 he was again appointed General Superintendent, where he remained until his recent appointment.



O. M. Shepard.

Philadelphia & Reading.—B. H. Bowman, Assistant Trainmaster at Harrisburg, Pa., has been appointed Assistant Trainmaster at Rutherford, Pa., succeeding G. O. Sarvis, resigned.

Texas & Pacific.—W. G. Mason, Superintendent of the Avoyelles division, has been appointed Superintendent of the Louisiana division, with office at Bunkie, La., having charge also of the line from Eunice to Bunkie, built by the Louisiana, East and West, and which was to be part of the Avoyelles division.

Traffic Officers.

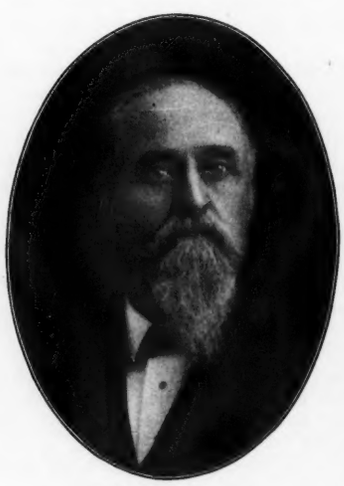
Chicago & North-Western.—H. G. Graves has been appointed General Baggage Agent, succeeding F. D. Taylor, assigned to other duties.

Wheeling & Lake Erie.—S. P. Woodside has been appointed to the new office of Assistant General Freight Agent at Pittsburg, Pa.

Engineering and Rolling Stock Officers.

Arkansas, Louisiana & Gulf.—See this company under Executive, Financial and Legal Officers.

Bangor & Aroostook.—Orlando Stewart, who recently retired as Superintendent of Motive Power and Equipment, is 74 years old. He was born at St. Albans, Me., and after a common school education began railroad work in 1847 as an apprentice on the Boston & Maine. After three years he went to the Erie as a gang boss. In 1853 he went to the Bellefontaine & Indiana, now part of the Cleveland, Cincinnati, Chicago & St. Louis, as shop foreman, and in 1856 returned to the East as a locomotive engineer on the Boston & Lowell, now operated by the Boston & Maine. In 1863 he was appointed general foreman of the United States government shops at Chattanooga, Tenn. He returned to his former position on the Boston & Lowell in 1866. In 1882 he went to the New York, Providence



Orlando Stewart.

& Boston, now a part of the New York, New Haven & Hartford, as Assistant Master Mechanic, and two years later was appointed Superintendent of Motive Power of the Fitchburg. He has been Superintendent of Motive Power and Equipment of the Bangor & Aroostook since 1894. Mr. Stewart is now living at 75 Wallingford Road, Brighton, Mass.

Boston & Albany.—E. E. Stone, Assistant Chief Engineer, has been appointed to the new office of Engineer of Maintenance of Way.

Buffalo, Rochester & Pittsburg.—J. M. Floesch, Chief Engineer, has resigned to go to a construction company at work on the Grand Trunk Pacific.

Union Pacific.—E. F. Fay, general foreman at Omaha, Neb., has been appointed Master Mechanic at Denver, Colo.

LOCOMOTIVE BUILDING.

The Chicago, Milwaukee & St. Paul is said to be figuring on 50 Mikado (4-8-4) locomotives to be built at its West Milwaukee shops.

The Due West Railway, Due West, S. C., which was reported in our advance sheet of October 2 as being in the market for locomotives, has bought second-hand locomotives from Joseph E. Bowen, Norfolk, Va.

The New York Central Lines, as reported in the *Railroad Gazette* of September 27, have ordered 20 ten-wheel locomotives, 99 consolidation locomotives, 60 Pacific locomotives, one 10-wheel switching and 10 six-wheel switching locomotives from the American Locomotive Company. The specifications are as follows:

General Dimensions.

Type of locomotive.	10-Wheel.	Consolidation.	Pacific.	10-wheel Switching.	6-wheel Switching.
Weight, total, lbs.	202,000	234,000	261,000	270,000	157,000
On drivers, lbs.	156,000	208,000	171,000	270,000	157,000
Cylinders	22 x 26 in.	23 x 32 in.	22 x 28 in.	24 x 28 in.	21 x 28 in.
Diam. of drivers, in.	69	63	79	52	57
Boiler, type	Rad. stay; Ex. w.-top.	Rad. stay; Strght top	Rad. stay; Ex. w.-top.	Rad. stay; Ex. w.-top.	Rad. stay; Strght top
Workg stm pres	200 lbs.	200 lbs.	200 lbs.	210 lbs.	180 lbs.
Tubes, No.	400	444	379	447	308
Tubes, diameter	2 in.	2 in.	2 in.	2 in.	2 in.
Tubes, length	14 ft. 11 in.	15 ft. ½ in.	20 ft.	19 ft.	11 ft. 6 in.
Firebox, length	105¼ in.	108 1/16 in.	108⅝ in.	109 in.	72⅛ in.
Firebox width	75¼ in.	75¼ in.	75¼ in.	74 in.	65¼ in.
Grate area, sq. ft.	54.93	56.47	66.4	55.4	32.7
Htg. sur., total, sq. ft.	3,327.0	.....	4,194.0	4,645.3	2,696.0
Water capacity, gals.	7,000	7,500	8,000	8,000	5,100
Coal capacity	12 tons.	12 tons.	14 tons.	12 tons.	7½ tons.

The San Antonio & Aransas Pass, which was reported as in the market in the *Railroad Gazette* of July 26, has ordered eight simple Pacific oil burning locomotives from the Baldwin Locomotive Works for January, 1908, delivery.

General Dimensions.

Type of locomotive	Pacific
Weight, total	127,000 lbs.
Weight on drivers	96,000 "
Diameter of drivers	62 in.
Cylinders	19 in. x 24 "
Boiler, type	Wagon top
" working steam pressure	180 lbs.
" number of tubes	230
" material of tubes	Charcoal iron
" diameter of tubes	2 in.
" length of tubes	13 ft. 1¾ in.
Firebox, length	71⅝ "
" width	34¼ "
" material	Otis steel
" grate area	17 sq. ft.
Heating surface, total	1,715 "
Tank capacity, for water	5,000 gals.
Oil capacity	1,800 gals.

Special Equipment.

Air brakes	Westinghouse
Axles	Baldwin specifications
Boiler lagging	Keasbey & Mattison
Brake-beams	Carnegie
Couplers	Janney
Headlights	Pyle National electric
Injector	Nathan
Journal bearings	Ajax bronze
Piston rod packings	Jerome metallic
Valve rod packings	Jerome metallic
Safety valve	Crosby
Sanding devices	Leach
Sight-feed lubricators	Nathan
Springs	Standard Steel Works
Tires, driving wheels	Midvale

The Delaware & Hudson has ordered 30 simple consolidation locomotives from the American Locomotive Company.

General Dimensions.

Weight on drivers	220,800 lbs.
Weight, total	250,000 "
Cylinders	23 in. x 30 in.
Diameter of drivers	57 "
Boiler, type	Wooten, wide firebox
" working steam pressure	210 lbs.
" heating surface, total	3,968 sq. ft.
" tubes, number	493
" tubes, material	Spellerized steel
" tubes outside diameter	2 in.
" tubes length	14 ft. 6 "
Firebox, length	126⅛ "
" width	114 "
" maker	Worth Bros.
Grate area	99.85 sq. ft.
Tank capacity	7,800 gals.
Coal capacity	14 tons

Special Equipment.

Air brakes	Westinghouse
Axles	Cunningham treated
Bell ringer	Sanson
Boiler lagging	Keasbey & Mattison
Brake-beams	Simplex
Brake-shoes	Engine—Perfecto
Brake-shoes	Tender—Diamond "S"
Couplers	Climax
Headlights	Dressel
Injector	Hancock
Piston rod packings	Trojan
Valve rod packings	Trojan
Safety valve	Consolidated
Sanding devices	Hanlon pneumatic
Sight-feed lubricators	Nathan and Ohio triple sight-feed
Springs	Railway Steel-Spring
Steam gages	Ashcroft
Tires, driving wheels	Midvale
Valve gear	Walschaert
Fire door flange	O'Connor
Draft gear:	For 5 engines, transom radial, Commonwealth Steel Co. For 25 engines, Miner
Side bearings	Miner gravity
Bumper beam front	Commonwealth Steel Co.
End sill, tenders	For 5 engines, Commonwealth Steel Co.
Centering device	For 25 engines, U. S. Metal & Mfg. Co.

CAR BUILDING.

The Tehuantepec National is in the market for cars.

The Harriman Lines have ordered 25 or more passenger cars.

The Pennsylvania is said to be figuring on additional steel cars.

The Manistee & Northeastern will build 20 flat cars at its own shops.

The Wabash, it is said, is contemplating the purchase of new equipment.

The Erie is said to be building 50 cabooses at its Buffalo and Kent shops.

The South & Western, it is said, has ordered 100 cars from the Pressed Steel Car Co.

The Idaho & Washington Northern has ordered four cabooses from the Pullman Co.

The Central of New Jersey has ordered 25 passenger cars from Harlan & Hollingsworth.

The Long Island has ordered 50 passenger cars from the American Car & Foundry Company.

The Wabash denies that it is considering buying new equipment, as reported in our advance sheet of October 9.

The Mexican Central denies that it intends to buy any all-steel passenger coaches, as reported in the *Railroad Gazette* of October 4.

J. S. Clarke, Chairman of the Public Works Committee, Calgary, Alb., is asking bids until November 1 on six semi-convertible street cars.

The Producers Tank Line Company, Louisville, Ky., has ordered 20 tank cars of 80,000 lbs. capacity from the McGuire-Cummings Company.

The Goodwin Manufacturing Company, St. Louis, has ordered 20 tank cars of 80,000 lbs. capacity from the McGuire-Cummings Company.

The Atchison, Topeka & Santa Fe has ordered one hundred 40-ft. refrigerator cars of 60,000 lbs. capacity from the American Car & Foundry Company.

The Due West Railway, Due West, S. C., which was reported in our advance sheet of October 2 as being in the market for cars, has bought second-hand cars from Joseph E. Bowen, Norfolk, Va.

The Louisville & Nashville, as reported in our advance sheet of October 9, will build one hundred 40-ft. refrigerator cars of 50,000 lbs. capacity at its New Decatur, Ala., shops during the first six months of 1908.

The Union Pacific has ordered 250 Hart convertible steel cars of 100,000 lbs. capacity from the Rodger Ballast Car Co. to be built by the American Car & Foundry Co. Delivery to begin December 15. These cars will weigh 43,000 lbs. and will measure 41 ft. 6 in. long, over all. The special equipment includes:

Bolsters	Truck, Simplex; Body, Commonwealth
Brake-beams	Damascus
Brake-shoes	American Brake-Shoe & Foundry Co.
Brasses	Hewitt
Couplers	Climax
Draft rigging	Miner
Journal boxes	McCord
Springs	Railway Steel-Spring
Trucks	Andrews side truck frames
Wheels	American Car & Foundry Co.

The Sterling Coal Company, Philadelphia, Pa., has ordered 250 steel coal cars of 100,000 lbs. capacity from the Cambria Steel Company. These cars will measure 32 ft. 3 in. long, over end sills; 10 ft.

1⅜ in. wide, over all, and 10 ft. high, over all; 30 ft. 5 in. long, 9 ft. 6 in. wide and 6 ft. 3⅞ in. high, inside measurements. These measurements are in accordance with Pennsylvania Railroad specifications for standard, class "G1a" gondolas, and the special equipment will also be in accordance with these specifications.

The San Antonio & Aransas Pass, as reported in the *Railroad Gazette* of September 20, has ordered six passenger coaches from the Pullman Company for January, 1908, delivery. These coaches will measure 60 ft. long, 9 ft. 8 in. wide and 14 ft. 1½ in. high, inside measurements. The special equipment includes:

Bolsters	Commonwealth
Brake-beams	Carnegie
Brake-shoes	Lappin
Brakes	Westinghouse
Couplers	Janney
Curtain fixtures	Forsyth
Curtain material	Pantasote
Door fastenings	Pullman standard
Journal boxes	Symington
Light	Pintsch
Paint	Murphy Varnish Co.
Platforms	Standard Steel
Roofs	S. A. & A. P. standard
Springs	Standard Steel Works
Trucks	S. A. & A. P. standard

The New York, Ontario & Western, as reported in our advance sheet of October 5, is in the market for 10 passenger cars. These cars will measure 64 ft. long, over end sills; 10 ft. wide; over side sills, and 14 ft. 3½ in. from rail to top of upper deck. Bodies and underframes will be of wood. The special equipment includes:

Bolsters	New York, Ontario & Western standard
Brake-beams	National Hollow or Simplex
Brake-shoes	American Brake-Shoe & Foundry Co.
Brakes	Westinghouse
Brasses	Brady
Couplers	Gould
Curtain fixtures	National
Curtain material	Texoderm
Draft rigging	Gould
Heating system	Not yet decided
Light	Safety Car Heating & Lighting, vapor system
Paint	Sherwin-Williams
Platforms	Gould, with Filion traps
Springs	Railway Steel-Spring
Trucks	New York, Ontario & Western standard
Vestibules	Gould
Wheels	McKee-Fuller

RAILROAD STRUCTURES.

Altoona, Pa.—The Pennsylvania, it is said, has bought 250 acres of land for new shops and for extending its yards in the vicinity of Altoona. Reports say that officials of the company admit that extensions to the shops at Altoona, and at points on the Pitsburgh division are planned, but deny that definite action has been taken.

Amarillo, Tex.—Land, it is said, has been bought by the Pecos Valley & Northeastern as a site for shops, also for a roundhouse.

Chicago, Ill.—The Baltimore & Ohio is said to be buying land as a site for a new freight terminal at Van Buren and Jefferson streets.

Cincinnati, Ohio.—Action will soon be taken by the City Council on the proposition to issue $298,000 of bonds as its share of the cost of a viaduct to be built over the Baltimore & Ohio Southwestern tracks. The railroad to pay $158,000.

Gibsland, La.—The Louisiana & North West is planning to put up a two-story freighthouse on the present site of its shops, and to put up a new foundry and machine shop in another location.

Jersey City, N. J.—Contracts are reported let by the Erie to Mullen & McDermott for the sub-structure and to the American Bridge Company for the superstructure of a bridge to be built over the Hackensack river. The work will involve the construction of about four miles of new double-track on the Newark and Greenwood Lake lines, and is expected to be finished by July of next year.

Long Island City, N. Y.—Plans are reported made for the main terminal building of the Belmont tunnel (New York & Long Island). The proposed building is to be six stories high and 150 ft. x 175 ft.

Milwaukee, Wis.—A resolution has been introduced providing for the elimination of 12 grade crossings on the Northern division of the Chicago, Milwaukee & St. Paul. The cost of the work will be between $750,000 and $1,000,000.

New York, N. Y.—The East 14th street car barns were recently damaged by fire; loss about $400,000.

Renfrew, Ont.—Surveyors are at work locating a site for a new freight shed and sidings for the Canadian Pacific here.

Rockport, Ind.—Surveys are being made to locate the site of the proposed bridge to be built over the Ohio river here.

Rossiter Junction, Pa.—Contracts are reported let to James K. Long & Son for putting up a passenger station here, and to Adams & Neal for the masonry work. The building is to be used jointly by the Pennsylvania and the New York Central.

Valley Grove, W. Va.—The Baltimore & Ohio has engineers at work on plans to put in concrete walls at various points to protect the tracks from high water. The first part of this work to be carried out will be at Valley Grove, where a wall 600 ft. long is to be built. After completion of this section the work will be continued at other points.

RAILROAD CONSTRUCTION.

New Incorporations, Surveys, Etc.

Annapolis, Washington & Baltimore.—See Washington, Baltimore & Annapolis.

Atlanta, Birmingham & Atlantic.—President H. M. Atkinson, of this company, is quoted as saying that the Alabama division will be in operation this month west to Talladega. The Atlanta branch is to be finished about December 1, when trains will be run from Atlanta to Brunswick. By July of next year it is expected to have all the extensions finished and the entire line in operation from Brunswick, Ga., to Birmingham, Ala.

Bartlesville Interurban.—Contracts are reported let for building this proposed line from Bartlesville, Okla., north to Dewey, four miles. J. J. Curl, President, Bartlesville, Ind. T.

Beaumont & Great Northern.—This road, which operates a line from Trinity, Tex., east to Livingston, 30 miles, is said to be planning to build an extension from Livingston southeast to Beaumont, 60 miles.

Boston & Albany.—Assistant General Manager Hustis in a newspaper statement says that about 26 miles of new third main track will be ready for use this winter, and that nine miles more has been authorized. The four-track section will be extended from Lake Crossing, Mass., westward to South Framingham. The sections of the new third track are between East Chatham and Richmond Furnace; Pittsfield and Dalton, and South Spencer and Charlton. Contractors are being engaged for the construction of a section from Rensselaer to Van Hoesen.

Calgary (Alb.) Street Railway.—Bids are wanted November 1 by S. J. Clarke, Chairman of Public Works committee, for building 12 miles of line, also the overhead line work, and a steel bridge with concrete abutments over the Elbow river.

California Northeastern.—See Southern Pacific.

Canadian Pacific.—Application, it is said, will be made by this company to Parliament at its next meeting for authority to build a branch from Killam, Alb., in township 44, ranges 13 and 14, west of the fourth meridian, northwest to Strathcona, about 80 miles.

Carolina & Tennessee Southern.—See Southern.

Colorado Roads.—Funds, it is said, have been secured by H. Larson and associates, of Rawlins, Wyo., to build a line from Steamboat Springs, Colo., north via Rawlins, on the Union Pacific, thence northwest to Lander, on the Chicago & North-Western, 225 miles.

Denver & Rio Grande.—Local reports say that surveys are under way for a line from Chama, N. Mex., southeast to a junction with the present Santa Fe-Antonito line at Servilleta, 60 miles.

Ensley Southern.—See Southern.

Fairmont & Southern.—Bids, it is said, will soon be asked for building this line, projected from Bellington, W. Va., north to Pittsburgh, Pa., 125 miles. (Sept. 20, p. 339.)

Grand Trunk Pacific.—Considerable progress is being made by this company on the main line west of Winnipeg. Treat & Johnston, who have the contract between Winnipeg and Portage la Prairie, 56 miles, will have the greater part of this work under way before winter, and expect to finish the grading about a month after the commencement of work next spring. McDonald & McMillan, who have the contract from Portage la Prairie west to Touchwood Hills, expect to have the work finished this month. Track has been laid from Portage la Prairie west for about 200 miles. It is said that the line will not be finished to Saskatoon this fall as the Canadian White Company will not finish the grading on its contract between Touchwood Hills and Saskatoon, 140 miles, for at least two months after the commencement of work next spring. Foley, Larsen & Co., who have the work from Saskatoon to Edmonton, 350 miles, have grading finished from Saskatoon west for 200 miles, and expect to have all the work finished next fall in time to move the 1908 grain crop from that section. The National-Transcontinental Railway Commission is said to expect that the contractors building the sections from Winnipeg east to Moncton, N. B., 660 miles, will carry on work all winter. It is estimated that 18,000 men are now at work on these contracts, and on the western section between Winnipeg and the Pacific coast and other railroad construction in this section about 20,000 men are at work.

Contracts, it is said, will shortly be let by this company for building 200 miles of main line from Edmonton, Alb., west.

GULF, BEAUMONT & GREAT NORTHERN.—See Gulf, Colorado & Santa Fe.

GULF, BEAUMONT & KANSAS CITY.—See Gulf, Colorado & Santa Fe.

GULF, COLORADO & SANTA FE.—This company has filed an amendment to its charter in accordance with the law passed by the last Legislature authorizing it to absorb and operate the Gulf, Beaumont & Kansas City, the Gulf, Beaumont & Great Northern, and the Texas & Gulf railroads, and to build an extension of the Gulf, Beaumont & Kansas City from Center, Tex., its present northern terminus northwest to Timpson, where connection is to be made with the Texas & Gulf. The latter is also to be extended north from Longview to a point on the Red river, about 125 miles. (April 19, p. 565.)

GULF SHORT LINE.—Incorporated in Oklahoma with $36,000,000 capital to build a line from Kansas City, Mo., southwest via Olathe, Ottawa, Emporia, Marion, McPherson and Hutchinson, Kan., thence through Oklahoma and Texas to Port Lavaco, Tex., on Matagorda bay, 1,500 miles, including branches in Kansas. The incorporators include: C. F. Bridge and T. Ragsdale, of Topeka, Kan.; L. E. Potts and J. P. Byrne, of Oklahoma City, and F. A. Jerran, of La Junta.

JASPER-FRENCH LICK EXTENSION.—See Southern.

MEMPHIS & CHATTANOOGA.—See Southern.

MISSOURI, KANSAS & TEXAS.—Reports are again being revived that this company will extend its Trinity-Colmesneil line from Colmesneil northeast to Shreveport, La., 125 miles.

NEW YORK & LONG ISLAND.—The south tube of the tunnel under the East river has been finished by the Degnon Construction Company and turned over to the railroad, which will equip it for operation. The north tube was turned over by the builders some time ago.

NEW YORK SUBWAYS.—The New York State Public Service Commission has approved the project to build the "Fourth avenue subway" in the Borough of Brooklyn, and bids for the work will be asked for shortly. The estimated cost is $25,000,000. (June 7, p. 819.)

NORTH & SOUTH TEXAS.—This company, which is building from Lufkin, Tex., southwest to Groveton, 31 miles, it is said, has plans made for its proposed line south to Houston, about 90 miles. (July 5, p. 27.)

OKLAHOMA CITY (ELECTRIC).—This company, operating 30 miles of electric lines in Oklahoma City and suburbs, and which is building an extension to connect with the lines it owns at Guthrie, has changed its name to the Oklahoma Railway Company. The capital stock has been increased from $1,000,000 to $3,000,000 and the revised charter provides for operating lines to include Guthrie, Norman, Yukon, Oklahoma and Spencer or Choctaw City. The directors are: A. H. Classen, J. W. Shartel, H. M. Brauer, E. W. Cooke, G. H. Brauer, G. W. Ford and J. M. Owen, all of Oklahoma City.

OKLAHOMA RAILWAY.—See Oklahoma City.

OKOLONA-BIG CREEK.—See Southern.

OPELOUSAS, GULF & NORTHEASTERN.—See Texas & Pacific.

PHILADELPHIA SUBWAY TERMINAL.—Incorporated in Pennsylvania to build a six-track subway under North Broad street from the city hall to the northern limit of the city near Clearfield street, about four miles. The plans include an extension north for a four-track subway to Olney avenue. George W. Goddard, President; M. Harris and C. Willing are also interested in the project.

ST. LOUIS SOUTHWESTERN.—Announcement is made that this company has plans ready for freight terminal improvements at Fort Worth, Tex., to cost about $500,000. A new main track is to be laid between Fort Worth and North Fort Worth; yard facilities are to be enlarged and a new steel and concrete bridge built across the Trinity river at that place.

SOUTHERN.—The report of this company for the year ended June 30, 1907, shows that double-track work and revision of grades and curvature was finished during the year on 206.81 miles. On the completion of about 85 miles more second-track will be laid from Orange, Va., to Charlotte, N. C.; between Clinton, Tenn., and Knoxville, and between Asheville, N. C., and Morristown, Tenn. During the year second-track has been laid between Pomona and Highpoint, 11.9 miles; between Highpoint and Spencer, 32.3 miles. This provides double-track between Goldsboro, N. C., and Spencer. Work is under way between Winesap, Va., and Sycamore, and grading is about finished between Durmid, Va., and Sycamore, 30 miles. This part of the line is expected to be put in operation about the first of the year. Between Winesap and Durmid, including a line through the city of Lynchburg, 6.9 miles, the work is heavy and includes a tunnel 1,300 ft. long. Grading has been finished on 2.26 miles near Galveston, Va. Second-track work between Peyton, Ga., and Austell, 11.56 miles, has been finished with the exception of a bridge over the Chattahoochee river.

On the Knoxville division during the year double-track has been laid from Knoxville, Tenn., to Mascot, 12.25 miles, and from Jefferson City, Tenn., to New Line, 10.32 miles. Work is nearing completion on the section between Mascot and Jefferson City, 14.3 miles; this included a new double-track bridge over the Holston river, and it is expected to have the entire line between Knoxville and New Line in operation this year. Grading work is almost finished for a second-track between Asheville, N. C., and Craggy, 4.4 miles. A new concrete viaduct has been built over the French Broad river on this section. At the close of the year about half the double-track work between Ooltewah Junction, Tenn., and Citico, 13.75 miles, was finished. In addition the company is building under the name of the Carolina & Tennessee Southern, a line from Bushnell, N. C., west along the northern bank of the Little Tennessee river to the North Carolina-Tennessee state line, 26 miles. On this grading is finished from Bushnell for 15.4 miles. From the state line the company is further extending this line under the name of the Tennessee & Carolina Southern to Maryville, Tenn., 38.8 miles; on the latter grading has been finished for 37.4 miles. On the completion of this work, the company will have a continuous line from Bushnell, N. C., west to Maryville, Tenn., 64.8 miles, with maximum grades of half of 1 per cent.

The Ensley Southern is being extended from its present terminus at Short Creek, Ala., northwest to Coal Creek, 3.39 miles; about half of the track has been laid. A spur is also being built to Coal Creek, 1.47 miles.

During the year work has been continued on the Memphis & Chattanooga from Chattanooga, Tenn., crossing the Tennessee river at the Narrows, thence through the valley of the Tennessee to a connection with the Memphis division at Stevenson, Ala., 42 miles. Grading and masonry work on the line from a point on the belt line near Chattanooga to the east portal of Lookout mountain tunnel is about 90 per cent. finished. The double-track tunnel through Lookout mountain, 3,500 ft. long, is about finished, only the arching near the portals remaining to be done. Both approaches for the Raccoon mountain tunnel are finished and tunnel excavation is under way. About 25 per cent. of the grading from Raccoon mountain to the Tennessee river crossing is finished. From this point to the state line all the grading and masonry, including the crossing at Battle creek, Sequatchi river and Tennessee river, are finished and 1.3 miles of track have been laid from South Pittsburgh, Tenn. The bridge over Valley creek is in place and the other structures for Sequatchi river and Tennessee river crossing are on the ground ready for erection.

Construction of the Jasper-French Lick Extension from Jasper, Ind., northeast to French Lick, 24.7 miles, including a tunnel 2,000 ft. long, is nearing completion, and it is expected to put the line in operation next month.

The extension of the Okolona-Big Creek in Mississippi from Vardaman, Miss., to Calhoun, 8.2 miles, was put in operation last December.

SOUTHERN PACIFIC.—It is said that a line will be built from Lake Arthur, La., to Gueydam, 10 miles, which will give the road a shorter line to New Orleans than its present route. A bridge will be built over Nementou river. The shortening of the line is decided on because of the early opening of the Colorado Southern, New Orleans & Pacific's line from Houston, Tex., to New Orleans, which will compete with the Southern Pacific.

The California Northeastern, under construction from Weed, Cal., north to Klamath Falls, is now in operation from Weed north for 40 miles, and about the first of next month will be finished to Dorris, 63 miles. Beyond this point a tunnel which is now being bored will delay the completion of the line to Klamath Falls until next spring.

TENNESSEE & CAROLINA SOUTHERN.—See Southern.

TEXAS & GULF.—See Gulf, Colorado & Santa Fe.

TEXAS & PACIFIC.—The Opelousas, Gulf & Northeastern began running passenger trains over its line October 2 from Melville, La., southwest to Crowley, 60 miles. (Sept. 13, p. 308.)

TWIN CITY & LAKE SUPERIOR (ELECTRIC).—This company, which is building a third rail protected line from St. Paul, Minn., to Superior Wis., 125 miles, air line, has graded over 30 miles, and will finish the first section of 49 miles about the first of November. It is expected that the whole line will be in operation by July 1, 1909.

WASHINGTON, BALTIMORE & ANNAPOLIS (ELECTRIC).—This company, building a high-speed electric line from Washington, D. C., northeast to Baltimore, 33 miles, has grading about finished and track laid for 75 per cent. of the way. The line is double-tracked throughout and has easy grades. The work includes a steel viaduct about half a mile long over the Patapsco river entering Baltimore.

When this work is finished on the main line, the company proposes to electrify the Annapolis, Washington & Baltimore, which it owns, from a junction with its main line at Academy Junction east to Annapolis, 14 miles, and will operate this line as its Annapolis branch. The line extends also west from Academy Junction to Annapolis Junction, on the Baltimore & Ohio, six miles. The Washington, Berwyn & Laurel (Electric), in operation from Washington via Hyattsville to Laurel, Md., 16 miles, also owned by this company, is to be reached by building a connecting line from Annapolis Junction to Laurel, about four miles.

Washington, Berwyn & Laurel (Electric).—See Washington, Baltimore & Annapolis.

Yankton, Wichita & Houston.—Surveys are reported being made by this company from Maple City, Kan., south through Oklahoma for 300 miles. The company proposes to build a line from Yankton, S. Dak., south to the gulf of Mexico. Fremont Hill, President, Cincinnati, Ohio.

RAILROAD CORPORATION NEWS.

Baltimore & Ohio.—See Chicago Terminal Transfer.

Boston & Maine.—See Maine Central.

Chicago & Milwaukee Electric.—A. C. Frost & Co., Chicago, are offering a block of the authorized Wisconsin division first mortgage, 5 per cent. bonds. The division runs from Lake Bluff to Milwaukee, 110 miles, and is to be opened for traffic by November 15.

Chicago, Burlington & Quincy.—See Chicago Terminal Transfer.

Chicago, Milwaukee & St. Paul.—Judge Smith McPherson in the federal court sitting at Kansas City, Mo., has granted a temporary injunction restraining the Secretary of State of Missouri from trying to forfeit the St. Paul's charter, which step was threatened under a recent Missouri law forbidding railroads from transferring to federal courts damage suits filed against them in state courts.

Chicago Terminal Transfer.—The annual meeting has been postponed until January 15. It is understood that the Baltimore & Ohio interests have reached an understanding with the Burlington interests according to which the latter will abandon suits attacking the Baltimore & Ohio ownership of the property, and the Baltimore & Ohio will buy the preferred stock held by minority holders and admit the Burlington as a tenant.

Cincinnati, Hamilton & Dayton.—Gross earnings for the year ended June 30, 1907, were $8,946,000, an increase of $548,000; net earnings, $1,885,000, an increase of $398,000. The deficit after charges was $861,000, which compares with a deficit of $1,148,000 at the end of the previous year.

Coal & Coke.—This company, which has $10,000,000 common stock, has created an issue of $10,000,000 preferred stock. The road runs from Leiter, W. Va., to Charlestown, 198 miles, with branches, and the company also owns 100,000 acres of coal lands. There are $9,268,000 5 per cent. first mortgage bonds of 1919 outstanding, and the increase in capital stock is understood to be in connection with a proposed reduction of the bonded debt to $5,000,000.

Council City & Solomon River.—J. B. Gedney has been appointed Receiver of this road, which has built 35 miles of road from Penelope Creek, Alaska, to Dickson, and is projected to Candle, Seward Peninsula, 65 miles farther. There is outstanding $895,460 capital stock and $347,000 6 per cent. bonds due May 1, 1908. The receivership proceedings were brought by officers of the company. It is said that the road can only be operated from the first of June to the middle of October because of heavy snow the rest of the year.

Detroit United Railway.—This company has passed its quarterly dividend of 1¼ per cent. on the $12,500,000 capital stock. A large part of the surplus was used for new equipment and improvements, because in the present money market securities to pay for these could not be advantageously issued. The annual rate has been 5 per cent. since August, 1905, and for four years before that it was 4 per cent.

Great Northern.—Estimated gross earnings of the lines directly operated, for the fiscal year ended June 30, 1907, were $50,048,000, an increase of $3,788,000; net earnings, after taxes, $18,563,000, a decrease of $2,958,000. Other income was $3,415,000, an increase of $1,213,000. Charges decreased slightly and the appropriations for improvements and equipment amounted to $4,935,000, a decrease of $196,000. The balance available for dividends was $12,963,000, equal to 8.6 per cent. on the capital stock. This balance is $1,522,000 less than in the previous year. The balance before the above deduction for improvements, etc., amounts to 11.9 per cent. on the capital stock. The surplus for the year was $2,156,000, a decrease of $3,029,000.

Gulf Line Railway.—This company, which operates a road from Hawkinsville, Ga., to Bridgeboro, 77 miles, of which 14 miles are leased with option of purchase, has asked permission to issue $325,000 5 per cent. first mortgage bonds. (May 31, p. 760.)

Illinois Central.—The annual meeting began on October 17, but it was expected that no business would be transacted for some time, because of the time needed for counting proxies. A committee consisting of L. C. Fritch, Assistant to the President; C. E. Wenman, formerly Assistant Secretary, and E. S. Conway, was appointed to sort the proxies. Stuyvesant Fish has secured an injunction restraining the Harriman interests from voting 286,731 shares owned by the Union Pacific, the Railroad Securities Company and the Mutual Life Insurance Company, on the ground that it is against the law of Illinois to have its roads managed by outside corporations. The injunction only restrains the voting of these shares in case the Harriman interests have not got a majority without them. If they prove necessary to Harriman control, the meeting is to be adjourned to December to give these interests time to show cause for removing the injunction.

Maine Central.—A quarterly dividend of 2 per cent. was paid on October 1 on the $4,918,000 stock. The annual rate has been 7 per cent. for the last four years and before that it was 6 per cent. Over half of the stock is owned by the Boston & Maine.

Mexican Central.—President Diaz of Mexico, in his recent message to Congress, announced that the proposed merger of the Mexican Central with the National Railroad of Mexico is being held up pending an improvement in the money market.

National Railroad of Mexico.—See Mexican Central.

Pacific Traction Company.—This company, which was recently incorporated in Maine and has acquired franchises and street railroads in Tacoma, Wash., has made a first mortgage to the Bankers' Trust Company of New York as trustee, securing an issue of $2,000,000 5 per cent. 20-year bonds of July 1, 1907. It intends to acquire other franchises and to build street railways in Tacoma and Olympia, as well as a connecting line between those cities.

Pennsylvania Company.—Kuhn, Loeb & Co., New York, announce that they will buy at once at par and interest all or any part of $10,000,000 of the $50,000,000 Pennsylvania Company's 4½ per cent. collateral trust improvement notes, due November 1, 1907.

St. Louis & San Francisco.—Francis, Bro. & Co., St. Louis, are offering at a price to yield 6 per cent. $340,000 of an authorized issue of $359,000 5 per cent. equipment notes, dated March 1, 1907, and maturing as follows: $19,000 on March 1, 1908, semi-annual instalment of $18,000 each from September 1, 1908, to September 1, 1915, inclusive, and semi-annual instalments of $17,000 each from that date to and including March 1, 1917. One instalment of $19,000 was paid on September 1, 1907. The notes are secured on 250 gondola cars and 150 Hart convertible cars bought from the American Car & Foundry Company, which endorses the notes.

Southern.—The average mileage operated in the fiscal year ended June 30, 1907, was 7,547 miles, an increase of 173 miles. Gross earnings were $56,657,994, an increase of $3,016,556; net earnings $11,958,712, a decrease of $1,909,587. Interest and rentals increased from $9,853,358 to $11,265,616. Only $1,500,000 out of earnings for the year was paid in dividends on preferred stock, the usual semi-annual dividend due October 1, 1907, having been passed. There was appropriated for improvements, betterments and charges not to be capitalized, $536,334, which is $463,493 less than in the preceding year. The surplus for the year was $253,987, a decrease of $975,252. Out of accumulated surplus a dividend of 1½ per cent., or $900,000, on the preferred stock was declared, payable October 17, 1907.

Stephenville North & South Texas.—This company has registered with the Secretary of State of Texas $322,000 first mortgage, 5 per cent. 40-year bonds secured on 20 miles of completed road in operation from Hamilton, Tex., north. The road is under construction to Stephenville, 24 miles farther.

Toledo Railways & Light.—The President has sent a circular letter to stockholders announcing that the directors favor passing the semi-annual dividend of 1 per cent. on the $12,000,000 capital stock due November 1. The surplus was more than enough to meet this payment, but much has been spent for improvements chargeable to capital account because of the unfavorable market for issuing securities for this purpose.

ANNUAL REPORTS.

THE CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY COMPANY—TWENTY-SEVENTH ANNUAL REPORT.

To the Stockholders:

The Board of Directors herewith submit their report of the operations and affairs of the Rock Island Lines for the fiscal year ended June 30, 1907.

The results of the operations for the year were as follows:

Gross earnings (increase $9,000,561.86, or 17.6 per cent.)	$60,238,419.91	
Operating expenses (increase $5,977,083.47, or 17.0 per cent.)	41,044,142.00	
Net earnings (increase $3,023,478.39, or 18.7 per cent.)		$19,194,277.91
Other income		745,181.71
Total income		$19,939,459.62
Taxes	$1,676,038.31	
Interest	8,279,300.02	
Rentals	1,233,604.22	11,188,942.55
Net income, after providing for all charges, being 11.6 per cent. on capital stock ($75,000,000.00)		$8,750,517.07
Dividends paid (5½ per cent. on capital stock)		4,116,728.00
Surplus for the year (increase $2,525,509.53)		$4,633,789.07

The increase in gross earnings was disposed of as follows:

Increase in expenditures for maintenance of the property (road and equipment)	$1,974,568.87
Increase in cost of movement and administration	4,002,514.60
Leaving in net earnings (33.5 per cent. of gross increase)	3,023,478.39
Total increase in gross earnings	$9,000,561.86

The property of the St. Louis, Kansas City & Colorado Railroad Company was taken over for operation on October 1, 1906. The greater portion of the cost thereof was carried last year in the general balance sheet as advances for construction and equipment.

The capital stock of the Chicago, Rock Island & Pacific Railway Company outstanding at the close of the previous fiscal year was $74,847,600, and has since been increased by the issue of $6,500 in exchange for a like amount of capital stock of the Burlington, Cedar Rapids & Northern Railway Company.

The amount of capital stock shown on general balance sheet as outstanding June 30, 1907, represents:

Capital stock of the Chicago, Rock Island & Pacific Railway Company, issued and outstanding	$74,854,100.00
Capital stock of the Burlington, Cedar Rapids & Northern Railway Company and Rock Island & Peoria Railway Company outstanding, for the purpose of taking up which there is reserved a like amount of the capital stock of the Chicago, Rock Island & Pacific Railway Company	145,900.00
Total authorized capital stock of the Chicago, Rock Island & Pacific Railway Company	$75,000,000.00

Of the outstanding capital stock of the Burlington, Cedar Rapids & Northern Railway Company, $5,000 is in the treasury of your company.

During the year the funded debt increased $15,880,000.

The cost of property and franchises increased $18,180,162.06. There were also expended $4,375,221.38 for additions and improvements.

The line Fordyce to Crossett, Ark., 56.85 miles, was put in operation February 1, 1907, and the line Tinsman to Eldorado, Ark., 35.81 miles, on June 23, 1907. These two lines compose what was reported a year ago as the uncompleted portion of the Little Rock & Southern Railroad, now a part of the Rock Island, Arkansas & Louisiana Railroad. That road is laid with 60-lb. steel rail and is ballasted with gravel. Standard Rock Island buildings and bridges, including a first-class brick depot at Fordyce, Ark., have been erected.

Trackage rights have been obtained over the rails of the Louisiana & Arkansas Railway Company and the Louisiana Railway & Navigation Company, to carry the line to Alexandria, La., and it is expected that the line from Alexandria to Eunice, La., will be operated in October, 1907. At this latter point connection will be made with the Colorado Southern, New Orleans & Pacific Railroad (Frisco), from Houston, Tex., to New Orleans, La., establishing a new through route of importance to the Rock Island Lines.

The earnings, operating expenses, taxes, interest, etc., of the operated portion of the Rock Island, Arkansas & Louisiana lines were included in the accounts of your company.

GENERAL.

The records of the industrial department show that there have been located along the Rock Island Lines during the year 327 new enterprises, at an estimated cost of about $8,500,000. These new enterprises are scheduled to employ over 8,000 persons.

During the past year your company built or made additions to 58 tracks to private industries, and four side tracks to coal mines.

During the fiscal year 109 locomotives, 95 passenger train cars (including one passenger motor car), 6,847 freight train cars, one derrick car and two other road service cars were received and placed in service.

The work of installing automatic block signals has been pushed, as will be attested by the expenditure of $220,509.58, for new and additional signal and interlocking plants. The greater portion of this amount was for the installation of automatic block signal apparatus.

To meet the growing demands of increased traffic, $4,089,934.18 have been expended for additional and improved terminals at various points.

The new freight depots and yards constructed in St. Louis by the Rock Island-Frisco Terminal Railway Company, were put in operation March 1, 1907. The money was provided jointly by this company and the St. Louis & San Francisco Railroad Company, each company receiving securities of the terminal company in reimbursement of its advances.

$3,000,000 of 5 per cent. bonds have been issued by the terminal company and guaranteed jointly by this company and the St. Louis & San Francisco Railroad Company, the unexpended balance of which is reserved for further additions and improvements.

Joint use of these terminals has been granted to the Chicago & Eastern Illinois Railroad Company.

The transfer yard of the Iowa Transfer Railway Company at Des Moines, Ia., referred to in the last annual report, has been completed and is being operated. The total amount advanced by your company as its one-fifth of the cost of this transfer yard was $6,200, for which was received 62 shares, par value $6,200, being one-fifth of the capital stock of the Iowa Transfer Railway Company.

The Peoria Railway Terminal Company, a new corporation, with a capital stock of $1,000,000 par value, has acquired all of the property of the Peoria & Pekin Terminal Railway Company, one-half of whose capital stock was owned by your company at the date of rendering the last annual report. In exchange for such capital stock your company has received one-half of the capital stock of the Peoria Railway Terminal Company, and the latter company is now operating the property.

Trackage rights were acquired and trains of the Chicago, Rock Island & Gulf Railway Company have been operated since July 1, 1906, over the Ft. Worth & Denver City Railway Company from Amarillo, Tex., to Dalhart, Tex., 82.06 miles. Your company has acquired similar rights and has operated its trains since November 25, 1906, over the line of the St. Louis & San Francisco Railroad Company from Wichita, Kan., to Medora, Kan., 48.07 miles.

During the year your company has advanced on account of the Trinity & Brazos Valley Railway Company, for construction and equipment of that line, $97,415.50, and on account of construction of important terminals at Galveston, Tex., $98,016.66.

Legislation by the various states which your lines serve, respecting rates and operating methods of railroads, has been excessive in quantity and severe in character. The legislatures of five such states have passed laws establishing two cents a mile as the maximum rate of passenger fare, and other laws have been passed by the several states calling for serious reductions in freight rates. Doubtless a large part of this legislation has been due to misconception of the actual conditions. At every opportunity it is the policy of the officers of your company to endeavor to establish better relations with the people of the various states, and to impress upon them the fact that the progress of the section of the country traversed by your road, and the continued prosperity thereof, require candid co-operation between the railroads and the other business interests. The aim of all must be to promote the welfare of the country, and it is to be hoped that when the situation is thoroughly understood, a spirit of mutual co-operation will be the result.

A complete inventory of material, fuel and supplies was taken April 30, 1907, and the necessary adjustment of the accounts made.

The accounts of your company at the close of the fiscal year were examined by Mr. Stephen Little.

It is a pleasure to acknowledge the hearty and necessary co-operation of officers and employees.

By order of the Board of Directors.

B. L. WINCHELL,
President.

ROCK ISLAND LINES.

Income Account; Year Ended June 30, 1907, Compared with Previous Year.

	1906-7.	1905-6.	Increase.	Per ct.
Average mileage operated	7,780.26	7,218.07	562.19	7.8
Earnings:				
Freight	$40,663,972.36	$34,695,823.88	$5,968,148.48	17.2
Passenger	16,449,765.44	13,917,030.64	2,532,734.80	18.2
Mail	1,356,868.48	1,138,631.15	218,237.33	19.2
Express	1,373,765.79	1,165,718.12	208,047.67	17.8
Miscellaneous	394,047.84	320,654.26	73,393.58	22.9
Total	$60,238,419.91	$51,237,858.05	$9,000,561.86	17.6
Operating expenses:				
Maint. of way and structures	$8,754,396.55	$7,302,489.58	$1,451,906.97	19.9
Maint. of equipment	7,184,128.08	6,661,466.18	522,661.90	7.8
Conduct'g transportation	23,420,948.42	19,630,076.17	3,790,872.25	19.3
General expenses	1,684,668.95	1,473,026.60	211,642.35	14.4
Total	$41,044,142.00	$35,067,058.53	$5,977,083.47	17.0
Net earnings	$19,194,277.91	$16,170,799.52	$3,023,478.39	18.7
Other income	745,181.71	1,015,837.26	270,655,55*	26.6
Total income	$19,939,459.62	$17,186,636.78	$2,752,822.84	16.0
Taxes	$1,676,038.31	$1,631,890.21	$44,148.10	2.7
Interest	8,279,300.02	7,748,169.72	531,130.30	6.9
Rentals	1,195,927.71	998,847.67	197,080.04	19.7
Improvements on leased lines	37,676.51	21,897.14	15,779.37	72.1
Total charges	$11,188,942.55	$10,400,804.74	$788,137.81	7.6
Available for dividends	$8,750,517.07	$6,785,832.04	$1,964,685.03	29.0
Dividends	4,116,728.00	4,677,552.50	560,824.50*	12.0
Surplus	$4,633,789.07	$2,108,279.54	$2,525,509.53	119.8
Appropriated for special improvement and equipment fund	.....	2,108,279.54	*2,108,279.54	100.0
Balance of surplus carried to credit of profit and loss.	$4,633,789.07	.....	$4,633,789.07	....

Dividends Declared During Year Ended June 30, 1907.

Dividend No. 105, 2 per cent. paid October, 1906	$1,496,908.00
Dividend No. 106, 1 per cent. paid January, 1907	748,520.00
Dividend No. 107, 1½ per cent. paid April, 1907	1,122,780.00
Dividend No. 108, 1 per cent, paid July, 1907	748,520.00
Total	$4,116,728.00

Profit and Loss.

Balance as of June 30, 1906			$17,202,469.38
Surplus for the year ended June 30, 1907, as per income account above		$4,633,789.07	
Interest prior to October 1, 1906, on advances by the Chicago, Rock Island & Pacific Railway Company to the St. Louis, Kansas City & Colorado Railroad Company	$829,587.75		
Interest prior to July 1, 1906, on advances for St. Louis, Mo., freight terminals	67,395.43	896,983.18	
Net profit from operation of mines for two years ended June 30, 1907		38,944.61	
Sundry liabilities written off		29,005.98	
		$5,598,722.84	
Less:			
Discount and expenses in connection with first and refunding mortgage gold bonds issued	$2,261,849.71		
Depreciation on tracks, structures and equipment, removed, sold, or destroyed:			
Tracks $13,752.55			
Structures 42,854.74			
Equipment 1,356,522.79	1,413,130.08		
Sundry uncollectible accounts written off	3,088.32	3,678,068.11	1,920,654.73
Profit and loss, as of June 30, 1907			$19,123,124.11

* Decrease; not included in total.

Statement of Securities Owned June 30, 1907.

IN CAPITAL ASSETS.	Face Value.	Book Value.
Included in advances for construction and equipment:		
Stocks:		
Gulf Construction Company	$25,000.00	$25,000.00
Included in investment account—stocks representing ownership of Rock Island Lines in sundry properties:		
Stocks—Railroads:		
Calumet Western Railway Co.	104,300.00	
Kankakee & Seneca Ry. Co.	5,000.00	
Keok. & Des. M. Ry. Co., preferred	575,100.00	
Keok. & Des M. Ry. Co., common	1,487,900.00	
Peoria & Bureau Valley R. R. Co.	10,000.00	
Stocks—Union depot, terminal, stock yards and coal companies:		
Atchison Union Depot & R. R. Co.	9,000.00	
Chicago Transfer & Clearing Co.—judgment note trust certificate	98,000.00	
Chicago Union Transfer Ry. Co., pref.	40,000.00	
Chicago Union Transfer Ry. Co., com.	40,000.00	
Coal Valley Mining Co.	50,000.00	
Consolidated Indiana Coal Co.	2,400,000.00	
Dering Coal Co.	1,700,000.00	
Gasconade Ry. Construction Co.	50,000.00	
Iowa Transfer Ry. Co.	6,200.00	
Kansas City Terminal Ry. Co.	99,900.00	
Keokuk Union Depot Co.	20,000.00	
Leavenworth Depot & R. R. Co.	25,000.00	
Memphis Union Station loan-participation certificate	120,000.00	
Minnesota Transfer Ry. Co.	7,000.00	
Missouri and Illinois Bridge & Belt Railroad Co.	17,000.00	
Morris Terminal Ry. Co.	25,000.00	
Peoria Ry. Terminal Co.	500,000.00	
Pueblo Union Depot & R. R. Co.	8,000.00	
St. Joseph Union Depot Co.	2,000.00	
St. Joseph Stk. Yds. & Terminal Co.	12,500.00	
St. Paul Union Depot Co.	103,600.00	
Terminal R. R. Assn. of St. Louis	205,800.00	
The Union Depot Co. of Kan. City, Mo.	45,000.00	
Union Stk. Yds. Co., Topeka, Kan.	13,100.00	
Total	$7,779,400.00	1,365,168.00
Included in stock of the Chicago & Alton Railroad Company:		
The Chicago & Alton R. R. Co—pref.	$4,880,000.00	
The Chicago & Alton R. R. Co.—com.	14,420,000.00	
Total	$19,300,000.00	9,605,970.49
Total in capital assets	$27,104,400.00	$10,996,138.49

ROCK ISLAND LINES.

Condensed General Balance Sheet, June 30, 1907, and Comparison with Previous Year.

ASSETS.

	1907.	1906.	Increase.
Capital Assets:			
Property and franchises	$243,498,382.20	$221,825,639.16	$21,672,743.04
St. Louis, Kansas City & Colorado Railroad Co.	.....	16,804,457.58	16,804,457.58*
Additions and improvem'ts current year	4,375,221.38	3,492,580.98	882,640.40
Advances for construction and equipment	4,385,825.57	3,354,913.05	1,030,912.52
Real estate	639,949.98	431,230.19	208,719.79
Investment account—stocks representing ownership of Rock Island Lines in sundry properties	1,365,168.00	1,136,583.54	228,584.46
Stock of the Chic. & Alton Railroad Company	9,605,970.49	9,581,542.87	24,427.62
Deposit with trustee for purchase of equipment under indenture of February 1, 1907	7,533,550.00	.....	7,533,550.00
Total	$271,404,067.62	$256,626,947.37	$14,777,120.25
First and refunding mortgage gold bonds held in the treasury (see contra)	$11,250,000.00	$11,250,000.00	.....
Current Assets.			
Cash	$9,917,499.05	$9,646,668.76	$270,830.29
Station agents and conductors: Debit $2,594,072.96; Credit 243,612.69	2,350,460.27	2,047,194.32	303,265.95
Companies and individuals: Debit $2,906,185.72; Credit 51,504.07	2,854,681.65	1,767,937.73	1,086,743.92
Traffic balances: Debit $961,472.93; Credit 869,487.74	91,985.19	†9,208.43	101,193.62
Express companies	303,125.21	177,614.51	125,510.70
U. S. postoffice department	411,369.35	291,245.12	120,124.23
Advances for construction, equipment, etc., fundable	854,693.62	.....	854,693.62
Loans and bills receivable	2,217,133.19	999,184.71	1,217,948.48
Bonds, etc., in treasury—unpledged	10,087,795.80	6,687,548.86	3,400,246.94
Stocks in treasury—unpledged	910,069.01	1,191,511.45	281,442.44*
Accrued income from inv'stm'ts	155,406.49	148,228.83	7,177.66
Prepaid insurance	156,123.30	85,973.67	70,149.63
Material and supplies	4,356,074.74	3,968,069.18	388,005.56
Total	$34,666,416.87	$27,001,968.71	$7,664,448.16
Deferred Assets.			
Open carrying accounts in process of adjustment: Debit $770,956.26; Credit 117,599.10	$653,357.16	†$187,438.02	$840,795.18
East St. Louis & Suburban Railway Company bonds	.....	49,725.00	49,725.00*
Total	$653,357.16	†$137,713.02	$791,070.18
Total	$317,973,841.65	$294,741,203.06	$23,232,638.59

LIABILITIES.

	1907.	1906.	Increase.
Capital Liabilities:			
Capital stock	$75,000,000.00	$75,000,000.00	.....
Funded debt	174,332,000.00	164,587,000.00	$9,745,000.00
Three-year notes due July 1, 1907	‡7,500,000.00	7,500,000.00	.....
Collateral trust gold notes due April 1, 1908	6,000,000.00	6,000,000.00	.....
Equipment trust notes	7,385,000.00	1,250,000.00	6,135,000.00
Total	$270,217,000.00	$254,337,000.00	$15,880,000.00
First and refunding mortgage gold bonds issued and held in the treasury (see contra)	$11,250,000.00	$11,250,000.00	.....
Current liabilities:			
Purchase money note for Dering Coal Co. stock	.....	$540,000.00	$540,000.00*
Unpaid vouchers and drafts	$2,845,601.08	1,433,603.27	1,411,997.81
Unpaid wages	2,556,021.30	2,047,550.92	508,470.38
Interest, rentals and dividends due July 1	2,788,589.00	2,789,767.37	1,178.37*
Taxes accrued (not due)	1,075,398.00	1,039,372.52	36,025.48
Interest and rentals accrued (not due)	1,342,077.14	1,073,047.63	269,029.51
Interest coupons due and not presented	212,065.00	.....	212,065.00
Dividends due, not cal'd for	7,007.07	3,135.25	3,871.82
Bonds matur'd, not pres'nt'd	26,500.00	.....	26,500.00
Notes payable	150,000.00	.....	150,000.00
Interim certificates for first and refunding mortgage gold bonds	§3,000,000.00	.....	3,000,000.00
Total	$14,003,258.59	$8,926,476.96	$5,076,781.63
Deferred Liabilities:			
Keok. & D. M. Ry. Co.—account equipment	$197,562.25	$197,562.25	.....
White & Black River Val. Ry. Co.—acct. equipmnt.	25,170.00	25,170.00	.....
C. C. Henderson, trustee	.....	50,000.00	$50,000.00*
Hospital fund (employees')	40,338.61	35,050.30	5,288.31
Total	$263,070.86	$307,782.55	$44,711.69*
Total liabilities	$295,733,329.45	$274,821,259.51	$20,912,069.94
Provisional Accounts:			
Equipm't replacement funds	$561,438.27	$213,415.92	$348,022.35
Insurance fund	447,670.28	395,778.71	51,891.57
Special improvement and equipment fund	2,108,279.54	2,108,279.54	.....
Total	$3,117,388.09	$2,717,474.17	$399,913.92
Grand total liabilities (including provisional accounts)	$298,850,717.54	$277,538,733.68	$21,311,983.86
Profit and loss	$19,123,124.11	$17,202,469.38	$1,920,654.73
Total	$317,973,841.65	$294,741,203.06	$23,232,638.59

NOTE.—In stating the assets and liabilities of the companies forming the Rock Island Lines, the holding of the Chicago, Rock Island & Pacific Railway Company in the bonds and capital stock of the auxiliary lines, together with loans between the various companies, have been eliminated from the liabilities and a like reduction made in the book value of the assets; the figures shown, therefore, represent the book value of the assets and the liabilities without duplication.

The classification of some of the items in the general balance sheet has been changed during the past year. To preserve comparisons the figures for last year have been restated to agree with the classification of the 1907 figures; hence, the 1906 figures do not agree in every detail with those published in the annual report for the previous year.

*Decrease.
†Credits.
‡Paid July 1, 1907.
§Exchanged July 1, 1907, for first and refunding mortgage gold bonds.

IN CURRENT ASSETS.		
Included in advances for construction, equipment, etc., fundable:		
Stocks:		
Rock Island-Frisco Terminal Ry. Co....	$299,700.00	
St. Louis, Rock Island Terminal Ry. Co.	11,300.00	
Total	$311,000.00	
Bonds:		
Rock Island-Frisco Terminal Ry. Co..	$437,000.00	
Total stocks and bonds	$748,000.00	
Included in bonds, etc., in treas.—unpledged:		
Atchison Union Depot & R. R. Co.	$4,500.00	
Chic. Rock Isl. & Pac. R. R. Co. (of Iowa)	480,837.50	
Consolidated Indiana Coal Co.	273,000.00	
Dawson Railway & Coal Co.	250,000.00	
Dering Coal Co.	450,000.00	
Kankakee & Seneca Ry. Co.	325,000.00	
Kansas City & Northwestern Ry. Co.	8,000.00	
Minnesota Transfer Ry. Co.	28,000.00	
*Peoria Ry. Terminal Co.	1,500.00	
Rock Isl. Imp. Co.—equipment series "A"	3,600,000.00	
Rock Isl. Imp. Co.—equipment series "B"	4,760,000.00	
The Chicago, Rock Island & Pacific Ry. Co.—first and refunding mortgage gold	21,000.00	
Total	$10,201,837.50	
Included in stocks in treasury—unpledged:		
Burlington, Ced. Rap. & Northern Ry. Co..	$5,000.00	
Cedar Rapids Auditorium Co.	1,000.00	
Central City Elevator Co.	4,000.00	
Des M., Iowa Falls & Northern Ry. Co.	1,000.00	
Kansas City Times News Co.	6,400.00	
Memphis Railroad Terminal Co.	9,900.00	
Nebraska Central Ry. Co.	99,700.00	
Nebraska Construction Co.	270,000.00	
St. Joseph Auditorium Co.	5,000.00	
The Chicago, Rock Island & Pac. Ry. Co..	275.00	
The Rock Island Co., preferred.	987,330.00	
The Rock Island Co., common	52,000.00	
Town and land companies in Kansas.	207,150.00	
Western Coal & Mining Co.	36,000.00	
Total	$1,684,755.00	
Total bonds and stocks in current assets	$12,634,592.50	$11,398,770.17
RECAPITULATION.		
Included in capital assets.	$27,104,400.00	$10,996,138.49
Included in current assets.	12,634,592.50	11,398,770.17
Total securities owned.	$39,738,992.50	$22,394,908.66

*3,000.00 owned jointly with the Chicago & Alton Railroad Company.

ST. LOUIS AND SAN FRANCISCO RAILROAD COMPANY—ELEVENTH ANNUAL REPORT.

To the Stockholders:

The Board of Directors herewith submit their report of the operations and affairs of the St. Louis & San Francisco Railroad Company's Lines (exclusive of the Chicago & Eastern Illinois Railroad) for the fiscal year ended June 30, 1907.

The results of operation for the fiscal year were as follows:

Gross earnings		$38,621,067.51
(Increase, $6,574,410.95, or 20.5 per cent.)		
Operating expenses		24,872,579.36
(Increase, $4,327,046.24, or 21.1 per cent.)		
Net earnings (Inc. $2,247,364.71, or 19.5 per cent.)		$13,748,488.15
Other income		1,540,866.55
Total income		$15,289,354.70
Taxes	$896,958.13	
Interest, rentals and other fixed charges	10,233,813.28	
		11,130,771.41
Net income after providing for all charges*		$4,158,583.29
Dividends paid: 4 per cent. on first preferred stock		199,742.12
Balance of surplus carried to profit and loss.		$3,958,841.17
(Increase, $2,169,447.66.)		

*Being equal to 4 per cent. on the first and second preferred stock ($21,000,000) and 11.44 per cent. on the common stock ($29,000,000).

There was a slight decrease in the mileage operated during the fiscal year, as compared with the previous year, caused by a remeasurement of line and the taking up of small sections of useless track.

The average mileage operated during the year was 5,061.72 miles, as compared with 5,068.92 for the preceding year, being a decrease of 7.20 miles.

The total main track mileage operated at June 30, 1907, was 5,064.16 miles.

The capital stock of the company outstanding at the end of the fiscal year was $50,000,000, being the same as in the preceding year, and is composed of:

$5,000,000 first preferred.
16,000,000 second preferred.
29,000,000 common.

The total funded debt at June 30, 1906, including that of leased and auxiliary lines was		$167,440,148.59
The net increase during the fiscal year was		10,080,153.61
Making the total funded debt at June 30, 1907		$177,520,302.20
The total amount of equipment bonds and notes outstanding at June 30, 1906, was		$8,078,629.97
The net increase during the fiscal year was		4,371,859.82
Making the total amount of equipment bonds and notes outstanding at June 30, 1907		$12,450,489.79

A comparison of the assets and liabilities of the company, and its leased and auxiliary lines, at June 30, 1907, with the figures of the preceding year, is shown on the comparative condensed balance sheet on pages 16 and 17.

The increase in the franchises and property accounts, including those of the leased and auxiliary lines, for the fiscal year was $8,214,792.31.

Liberal expenditures were made during the fiscal year for additions and improvements to the property, and to its equipment.

The various classes of rolling stock added, are shown on statements, pages 41 and 42, and in addition thereto contracts were placed for 70 freight, 10 passenger and 10 switch locomotives, 87 passenger train cars and 5,255 freight cars, but deliveries of same could not be obtained until the last half of the calendar year 1907.

Contract has been let for the construction of new car and engine shops at Springfield, Mo., to be completed by February 1, 1908, at a cost of approximately $1,350,000.

A new union passenger station at Birmingham, Ala., was constructed during the year jointly by the lines centering at that point, and this company in conjunction with all the other lines interested, has guaranteed the bonds issued covering the cost thereof. The interest charge is to be apportioned between the lines using the terminals on the basis of cars handled.

The station, though not quite completed, was put in operation at July 1, 1907, and 4 per cent. bonds to the amount of $1,190,000 had then been issued in payment of the property, one-sixth thereof, or $198,333.33 being the amount guaranteed by this company.

The new freight depots and yards constructed in North St. Louis by the Rock Island-Frisco Terminal Railway Company were put in operation March 1, 1907. The money was provided jointly by this company and the Chicago, Rock Island & Pacific Railway Company, each company receiving securities of the terminal company in reimbursement of its advances.

$3,000,000 of 5 per cent. bonds have been issued by the terminal company and guaranteed jointly by this company and the Chicago, Rock Island & Pacific Railway Company, the unexpended balance of which is reserved for further additions and improvements.

Joint use of these terminals has been granted to the Chicago & Eastern Illinois Railroad Company.

The company has acquired, through the proceeds of its $7,500,000 five-year, 5 per cent. collateral trust gold notes, dated January 1, 1906, all the capital stock (except Directors' shares), and all the bonds of Colorado Southern, New Orleans & Pacific Railroad Company. The property of the last named company has been leased to this company for the period of 999 years from April 30, 1907. Through the ownership by Colorado Southern, New Orleans & Pacific Railroad Company of all the stock (except Directors' shares), of the Orange & Northwestern Railroad Company and of the Beaumont, Sour Lake & Western Railway Company, a through line will be in operation from Houston to Baton Rouge upon the completion of construction work now in progress (see page 74). From Baton Rouge to New Orleans the trains of your company will be operated into New Orleans under a trackage agreement with the Illinois Central Railroad Company and Yazoo & Mississippi Valley Railroad Company.

The increase in the tonnage carried during the fiscal year was 2,305,162 tons, or 16.64 per cent., and the increase in number of passengers carried was 1,194,353, of 19 per cent.

The earnings from operation per mile of road for the fiscal year were $7,630.03, an increase over the preceding year of $1,307.84, or 17 per cent., and is the largest revenue per mile of road earned by the company in any year.

The percentage of all fixed charges and taxes to net income for the fiscal year was 72.8 per cent., as compared with 82.4 per cent. for the preceding year, and 93.3 per cent. for the year 1905. This shows a healthy growth in the financial strength of the company.

The industrial department has reported that 338 new industrial plants, employing over 12,000 men and costing approximately $9,000,000, have been located on the tracks of the Frisco lines during the fiscal year.

It is encouraging to note this expansion of industrial development going on in the territory tributary to the company's lines, as it insures, to a large extent, a continued increase in both freight and passenger traffic.

The crops for the current year in the territory tributary to the company's lines are about normal.

The net receipts from land sales and royalties for the fiscal year were:

St. Louis & San Francisco R. R.	$371.46
Kansas City, Fort Scott & Memphis Ry.	24,929.97
	$25,301.43

This amount was credited to other income in the income account for the year.

The usual statements showing the income and profit and loss accounts, condensed balance sheet and statistical exhibits, are appended to this report and show the results of the operation of both properties and their financial condition at the end of the fiscal year.

The books and accounts of the company at the close of the fiscal year were examined by Mr. Stephen Little.

Acknowledgment of the faithful and efficient services rendered by officers and employees during the year is here made.

By order of the Board of Directors.

A. J. DAVIDSON,
President.

ST. LOUIS & SAN FRANCISCO RAILROAD LINES.

Income Account; Fiscal Year Ended June 30th, 1907, Compared with Previous Years.

	1906-7.	1905-6.	Increase.	Per ct.
Average mileage operated...	5,061.72	5,068.92	7.20*	0.14
Earnings:				
Freight	$26,848,664.91	$21,955,975.42	$4,892,689.49	22.3
Passenger	9,169,400.43	7,908,644.11	1,260,756.32	15.9
Mail	885,662.71	704,415.22	181,247.49	25.7
Express	998,864.97	882,232.39	116,632.58	13.2
Miscellaneous	718,474.49	595,389.42	123,085.07	20.7
Total	$38,621,067.51	$32,046,656.56	$6,574,410.95	20.5
Operating expenses:				
Maint. way & structures.	$5,406,107.20	$4,049,093.65	$1,357,013.55	33.5
Maint. of equipment....	4,699,674.36	3,803,210.75	896,463.61	23.6
Condcting transportation	13,610,703.47	11,742,742.07	1,867,961.40	15.9
General expenses	1,156,094.33	950,486.65	205,607.68	21.6
Total	$24,872,579.36	$20,545,533.12	$4,327,046.24	21.1

Net earnings	$13,748,488.15	$11,501,123.44	$2,247,364.71	19.5
Other income	1,540,866.55	1,632,659.89	91,793.34*	5.6
Total income	$15,289,354.70	$13,133,783.33	$2,155,571.37	16.4
Taxes	$896,958.13	$943,559.23	$46,601.10*	4.9
Interest	5,419,637.54	5,178,866.90	240,770.64	4.6
Rentals and sinking fund	3,179,293.74	3,067,339.57	111,954.17	3.6
Div. on trust certificates:				
K. City, Ft. S. & M. Ry.	540,400.00	540,400.00	.....	...
Chic. & E. Ill. R.R.	1,094,482.00	1,094,482.00	.....	...
Total charges	$11,130,771.41	$10,824,647.70	306,123.71	2.8
Available for dividends	$4,158,583.29	$2,309,135.63	$1,849,447.66	80.1
Dividends:				
4 per cent. on first preferred stock in 1907; 4 per cent. on first preferred, and 2 per cent. on second preferred stock in 1906.	$199,742.12	$519,742.12	$320,000.00*	61.6
Surplus, carried to credit of profit and loss	$3,958,841.17	$1,789,393.51	$2,169,447.66	121.2

*Decrease; not included in totals.

ST. LOUIS & SAN FRANCISCO RAILROAD LINES.

Statement of Securities Owned, as of June 30th, 1907.

(In Property Account.)

Stocks:	Face value.	Book value.
Arkansas Coal & Mining Co.	$11,250.00	
Crescent Hotel Co., Eureka Springs, Ark.	15,198.00	
Kansas Southwestern Ry. Co.	181,000.00	
St. Louis & San Francisco R.R. Co.:		
First preferred stock	6,535.10	
Second preferred stock	53.00	
Common stock	149.60	
St. Louis & North Arkansas R. R. Co.	20,000.00	
Fort Smith & Van Buren Bridge Co.	175.00	
Fort Smith & Southern Ry. Co.	1,100.00	
Fayetteville & Little Rock R. R. Co.	4,500.00	
The Joplin Railway Company	900.00	
Little Rock & Texas Ry. Co.	3,500.00	
Oklahoma City Terminal R. R. Co.	100,000.00	
Paris & Great Northern R. R. Co.	4,500.00	
Peirce City Real Estate Co.	54,800.00	
Pittsburg & Columbus Ry. Co.	2,500.00	
St. Louis, Wichita & Western Ry. Co.	500.00	
St. Louis, Arkansas & Texas Ry. Co.	1,100.00	
Springfield & Northern Ry. Co.	1,500.00	
Springfield & Southern Ry. Co.	900.00	
Springfield Connecting Ry. Co.	3,500.00	
St. Louis & Oklahoma City R. R. Co.	900.00	
Terminal Railroad Association of St. Louis.	205,800.00	
New Orleans Terminal Ry. Co.	1,000,000.00	
Ozark & Cherokee Central Ry. Co.	2,880,000.00	
Winchell Townsite Co.	2,000.00	
Total securities in property account	$4,502,360.70	$203,845.69

(In Current Assets.)

Stocks:		
Mobile, Jackson & Kansas City R.R. Co.	$280,000.00	
Gulf & Chicago Ry. Co.	280,000.00	
Colonial Hotel Company	5,000.00	
Jasper Land Company	8,666.67	
Hotel Realty Company	5,000.00	
Kirby Lumber Company	1,942,500.00	
Kansas City Belt Ry. Co.	120,000.00	
Taylor City Belt Ry. Co.	30,000.00	
Star Publishing Co. (Fort Worth)	200.00	
Birmingham Terminal Co.	25,000.00	
Total stocks	$2,696,366.67	
Bonds:		
K. C., Ft. S. & G. R.R. Co., 1st Mort. 7%	$1,000.00	
St.L., M. & S. E. R.R. Co. 1st Mort. 4% scrip	750.00	
5-year 4½ per cent. gold bonds	71,475.07	
St. L. & S. F. R.R. Co., Con. Mort. 4% scrip	159.00	
2½-year 5 per cent. gold notes	*6,500,000.00	
5-year 4½ per cent. gold notes	113,068.02	
(St. L., S. F. & N. O. R.R.)		
Rock Island-Frisco Terminal Ry. Co. 1st Mort. 5 per cent. bonds	396,622.45	
Memphis Union Depot Co., 5 per cent. note	120,000.00	
Total bonds.	$7,203,074.54	
Total securities in current assets	$9,899,441.21	$8,858,016.63
Total securities owned	$14,401,801.91	$9,061,862.32

*$4,751,000 of these notes are deposited as collateral to notes payable.

ST. LOUIS & SAN FRANCISCO RAILROAD LINES.

Condensed General Balance Sheet, June 30th, 1907, and Comparison with Previous Years.

ASSETS.

Capital Assets:	1907.	1906.	Increase.
Franchises and property	$170,544,848.03	$163,670,111.19	$6,874,736.84
Stocks and bonds owned	203,845.69	203,845.69	.....
Total franchises & property	$170,748,693.72	$163,873,956.88	$6,874,736.84
Leasehold estate (K. C., Ft. S. & Mem. Ry.)	$51,729,525.06	$50,591,075.97	$1,138,449.09
Leasehold estate (K. C., M. & Birm. R. R.)	9,175,875.76	9,175,875.76	.....
Franchises and property, auxiliary companies	7,451,879.52	7,250,273.14	201,606.38
Chic. & E. Ill. R. R. Co.:			
Preferred stock, cost of	9,321,550.00	9,321,550.00	.....
Common stock, cost of	18,239,237.13	18,239,237.13	.....
New equipment, under equipment trusts	11,731,234.01	7,261,925.55	4,469,308.46
Securities under coll. trust notes of 1908, cost of	1,225,325.00	.....	1,225,325.00
Total	$279,623,320.20	$265,713,894.43	$13,909,425.77
Current Assets.			
Cash in treasury	$880,833.16	$1,091,051.11	$210,217.95*
Cash in hands of fiscal agents.	2,373,751.91	2,550,486.10	176,734.19*
Due from agents & conductors: Debit $1,339,109.10 Credit 25,545.79	1,313,563.31	941,664.84	371,898.47
Due from R.R. Co., acc't traffic: Debit $1,263,372.39 Credit 964,304.07	299,068.32	193,152.05	105,916.27
Due from companies & individuals: Debit $2,388,444.82 Credit 3,295.81	2,385,149.01	1,990,486.57	394,662.44
Due from U. S. government	236,328.35	181,160.43	55,167.92
Securities in treasury unpledged (cost of)	4,107,016.63	1,849,778.19	2,257,238.44
Pledged as coll. under notes payable (cost of)	4,751,000.00	.....	4,751,000.00
Supplies on hand	2,870,441.61	2,185,324.93	685,116.68
Advances account construction (fundable)	864,853.65	954,295.76	89,442.11*
Total	$20,082,005.95	$11,937,399.98	$8,144,605.97
Deferred Assets.			
Open carrying acc'ts in process of adjustment: Debit $844,894.25 Credit 337,954.53	$506,939.72	$425,938.72	$81,001.00
Trustees sinking fund accounts	352,456.93	229,529.38	122,927.55
Sinking funds	87,541.25	95,346.88	7,805.63*
Total	$439,998.18	$324,876.26	$115,121.92
Total Assets	$300,652,264.05	$278,402,109.39	$22,250,154.66

LIABILITIES

Capital Liabilities.	1907.	1906.	Increase.
Capital stock: First preferred	$5,000,000.00	$5,000,000.00	.....
" " Second pref'd.	16,000,000.00	16,000,000.00	.....
" " Common	29,000,000.00	29,000,000.00	.....
Funded debt	123,054,582.20	113,846,428.59	$9,208,153.61
Total capital and bonds	$173,054,582.20	$163,846,428.59	$9,208,153.61
Outstanding securities:			
Leasehold estate (K. C., Ft. S. & M. Ry.)—Stock:			
Preferred certificates	$13,510,000.00	$13,510,000.00	.....
Funded debt	38,295,300.00	37,423,300.00	$872,000.00
Equipment bonds & notes.	2,885,202.00	3,286,304.00†	401,102.00*
Total (K.C., Ft. S. & M.	$54,690,502.00	$54,219,604.00	$470,898.00
Leasehold estate (K. C., M. & Birm. R. R.):			
Funded debt	$9,247,420.00	$9,247,420.00	.....
Funded debt, aux. companies.	6,923,000.00	6,923,000.00	.....
Stock trust certificates:			
Preferred (C. & E. Ill.)	9,317,550.00	9,317,550.00	.....
Common (C. & E. Ill)	18,044,500.00	18,044,500.00	.....
Equipment notes outstanding.	9,565,287.79	4,792,325.97	$4.772,961,82
Total	$280,842,841.99	$266,390,828.56	$14,452,013.43
Current Liabilities.			
Notes payable	$5,577,250.00	$748,449.79	$4,828,800.21
Audited vouchers and pay rolls	4,110,884.18	3,813,130.68	297,753.50
Interest and dividend matured	2,695,243.10	2,434,351.00	260,892.10
Interest accrued (not due)	1,000,417.62	1,007,483.98	$7,066.36*
Taxes accrued (not due)	240,978.81	224,092.39	16,886.42
Total	$13,624,773.71	$8,227,507.84	$5,397,265.87
Provisional Accounts.			
Sinking fund accrued.	$295,042.53	$302,681.97	$7,639.44*
Improvement fund (K. C. & M. Ry. & Bridge Co.)	7,563.47	10,112.77	2,549.30*
Total	$302,606.00	$312,794.74	$10,188.74*
Grand total liabilities.	$294,770,221.70	$274,931,131.14	$19,839,090.56
Profit and loss	5,882,042.35	3,470,978.25	2,411,064.10
Total	$300,652,264.05	$278,402,109.39	$22,250,154.66

NOTE.—In stating the assets and liabilities of the companies covered by this report, for the current fiscal year, the holdings of the St. Louis & San Francisco R.R. Co., in the bonds and capital stocks of leased and auxiliary lines have been eliminated, and for the purpose of comparison similar changes have been made in the 1906 figures.

*Decrease.

†$566,304 of this amount was included in "Funded debt" of the K. C., Ft. S. & M. Ry. Co., in the June 30, 1906, report and the remainder, or $2,720,000, in "Equipment notes outstanding."